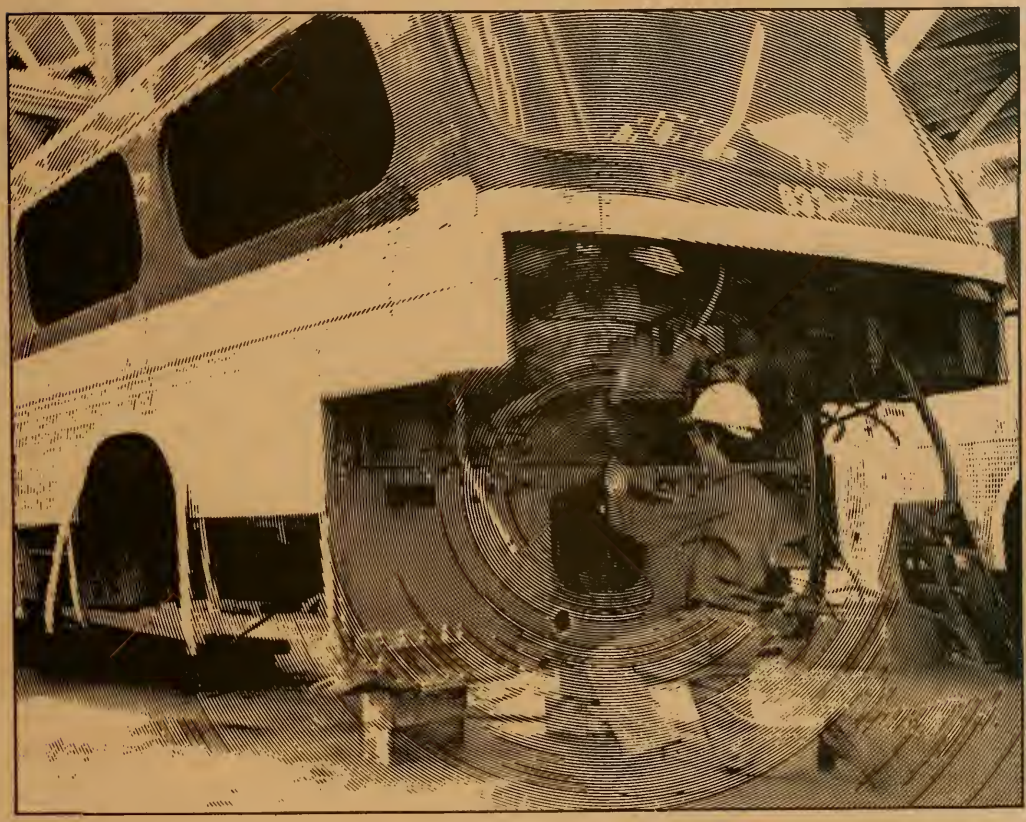
SUBURBAN BUS STORAGE & MAINTENANCE FACILITIES PLAN



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SUBURBAN BUS STORAGE AND MAINTENANCE FACILITIES PLAN

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EXECUTIVE SUMMARY

The Regional Transportation Authority was established in 1974 to aid and assist public transportation in Northeastern Illinois. Since its inception, approximately 250 bus routes have been initiated and/or improved. Services have been extended to previously unserved portions of the region.

This rapid expansion has placed a heavy burden on the system of bus garage facilities in the region. This report summarizes a planning study conducted to develop a long range plan for the improvement of bus storage and maintenance facilities in suburban Northeastern Illinois. The needs of the City of Chicago have been addressed in a separate Facilities Plan developed by the Chicago Transit Authority.

Conclusions and Recommendations

The total cost of the facilities plan presented in this report is estimated to be $60 million. Of this total, $35 million will be required for improvements during the next five years. The highlights of the improvement program are as follows:

- In the suburban area, four operating divisions should be formed. These would be the North, West, South, and Fox Valley Divisions.
- Each division should have one main facility, or division garage, where administrative and major maintenance activities are centralized.

- Each division should have one or more inspection garages where daily operations and running maintenance activities take place.

- A total of fourteen suburban facilities are recommended. These include the four division garages and ten inspection garages.

- The area now served by the Chicago Transit Authority should continue as a fifth operating division.

- The paratransit vehicle fleet should have its major maintenance requirements served by the four division garages.

- Construction of eight new suburban facilities is recommended: North Division (Palatine Township), West Division (Proviso Township), South Division (Harvey-Hazel Crest Area), Fox Valley Division (Elgin), North Shore Inspection (Niles Township), DuPage Inspection (Milton Township), Aurora Inspection (Aurora), and McHenry County Inspection (Woodstock).

- Six existing facilities should be renovated and expanded: Waukegan Inspection, Highland Park Inspection, Wilmette Inspection, NORTRAN Inspection, Suburban Transit Inspection and Joliet Inspection.

Existing and Proposed Services

The existing RTA suburban bus services are provided by fourteen suburban bus operations and seven private carriers under direct contracts to the RTA. As of July 1, 1980, a total of 591 vehicles were operated during the peak period on RTA bus services. An additional 84 vehicles had been programmed for service but not yet implemented. Therefore, a 1980 base fleet of 675 was used for this analysis.

On the basis of future population and employment projections, the future fleet of vehicles was projected to increase to 965 buses by 1990 and 1135 buses by the year 2000. Under an environment of severely restricted or high priced energy, the fleet would be expected to grow to 1370 vehicles by the year 2000. The year 2000 "Normal" energy projection of 1135 vehicles was selected as the design fleet to be used by the study.

Bus Storage and Maintenance Needs Analysis Results

Six broad regional facilities alternatives were defined. Each of these alternatives further defined a variety of subschemes within different parts of the region. By examining each of the possible combinations of these subschemes, over one hundred alternatives were evaluated.

The alternatives were structured to allow an evaluation of various operations and maintenance schemes. The six regional alternatives ranged from a very concentrated scheme of three

major inner-suburban facilities to a very decentralized scheme which evaluated a total of eleven inner-suburban facilities.

A major element of the alternatives had to do with the way in which maintenance activities are carried out. At the present time, maintenance activities vary greatly from one facility to the next. The plan developed by this study develops a region-wide approach which will provide levels of specialized equipment and labor not possible with today's fragmented system.

The alternatives were evaluated using three broad categories of evaluation criteria. These include capital costs, operating costs and nonmonetary factors. The capital cost items include land acquisition, construction costs and equipment requirements. Operating cost factors include deadhead mileage, administrative and maintenance costs. The cost of the revenue service (drivers wages and fuel etc.) were not included since they would remain constant across all plans. Finally, nonmonetary factors include such considerations as ease of implementation, phasing opportunities and system compatibility.

Recommended Plan

The recommended plan is composed of five operating divisions: North, West, South, Fox Valley and Chicago. Each of the suburban operating divisions include one main garage, called the division garage, where administrative and major maintenance activities for the division would be centralized. In addition,

one or more inspection garages would be located in each division. These inspection garages would be responsible for daily operations, servicing and running repairs. Major maintenance activities for the paratransit fleet will also be conducted at the division garages. Figure 1 illustrates the recommended facilities plan.

The North Division would serve North and Northwest Cook County and Lake County. The six facilities in the division would include the division garage in Palatine Township (95 buses) and inspection garages in Waukegan (65 buses), Highland Park (15 buses), Wilmette (25 buses), Niles Township (80 buses) and at the existing NORTRAN garage (80 buses).

The West Division would serve West Cook County, DuPage County and the Bolingbrook area of Will County. The two facilities in the division would include the division garage in Proviso Township (230 buses) and an inspection garage in Milton Township (120 buses).

The South Division would serve South and Southwest Cook County and most of Will County. The division garage would be located in the Harvey-Hazel Crest area (175 buses). The inspection garages would be located in Joliet (65 buses) and at the existing Suburban Transit facility (80 buses).

The Fox Valley Division would serve Kane and McHenry Counties. The division garage would be located in Elgin (65 buses). The two inspection garages would be located in Aurora (40 buses) and Woodstock (20 buses).

The Chicago Division would serve the area now served by the Chicago Transit Authority. The service now operated in this area differs in level of service and service hours from that operated in the suburban areas. These differences are likely to continue for some time. Therefore, this area should remain a separate operating division.

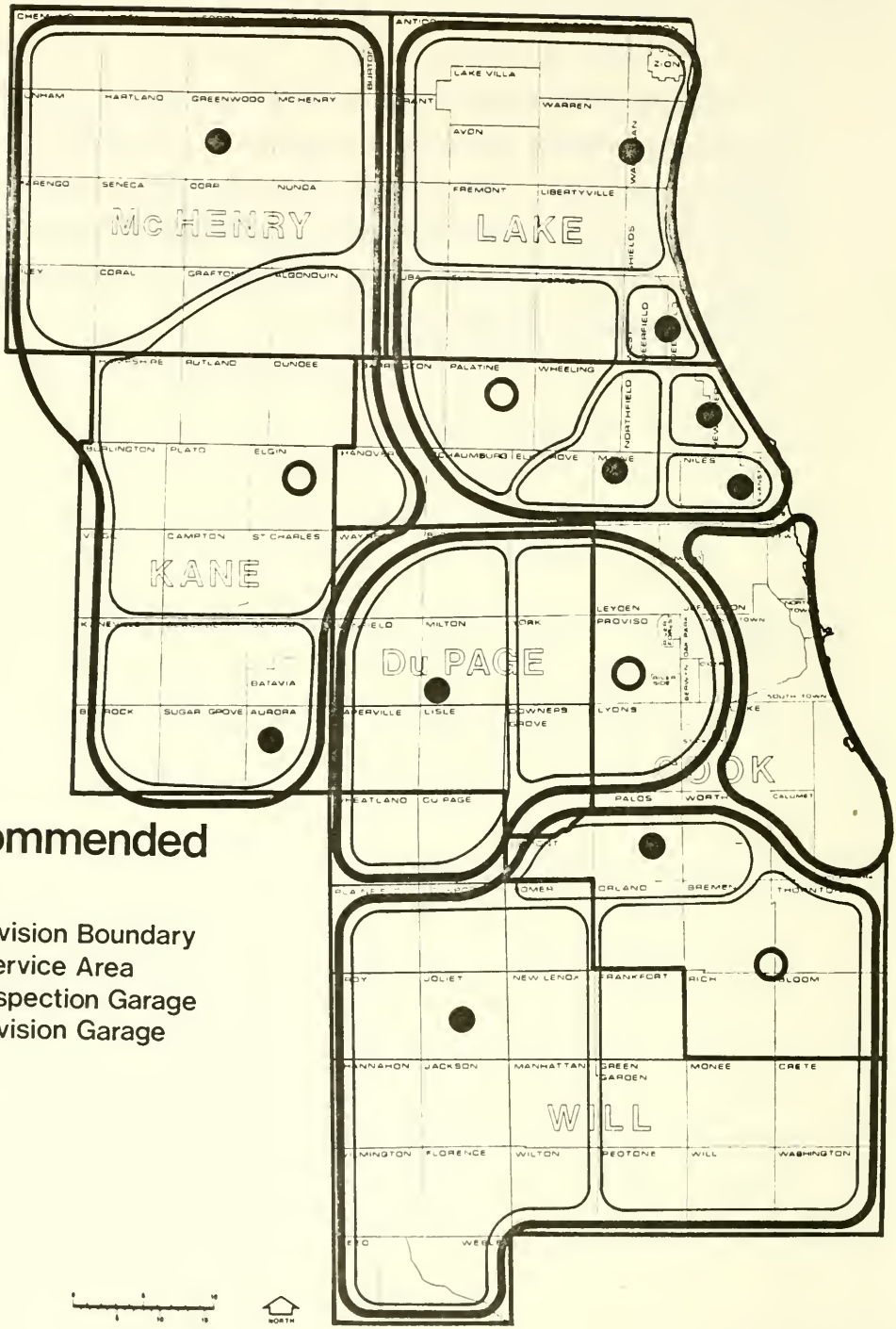

Figure 1

Recommended Plan

- Division Boundary
- Service Area
- Inspection Garage
- Division Garage

CHAPTER 1

INTRODUCTION

During the last few years, the inadequacies of the existing Regional Transportation Authority bus facilities system have been widely recognized. The need for improvements and new facilities has now reached a critical stage. This study was initiated to provide an overall plan for the development of bus maintenance and storage facilities throughout the suburban area.

Study Overview

The plan was developed through a series of work elements which later chapters will describe in detail. Generally, the process had six broad elements.

1) Fleet Size Estimates. Estimates of future fleet requirements, and distribution throughout the region were prepared for 1990 and year 2000.

2) Facility Conditions. All existing garage facilities were inventoried as to their location, size, functional usefulness and physical condition.

3) Standards Development. A set of standards were developed to be used in evaluating existing and proposed garage facilities.

These evaluation standards included labor requirements, space utilization guidelines, and cost estimate guidelines.

4) Alternatives Development. Alternatives were developed which both presented a wide range of development options and offered pragmatic solutions to facility problems facing the region. The alternatives were defined so as to examine a large variety of facility locations, sizes and maintenance functions.

5) Evaluation of Alternatives. The alternatives were evaluated utilizing criteria in three general categories: impact on operating expenses, impact on capital costs, and nonmonetary factors (such as ease of implementation).

6) Plan Development. Based on the detailed evaluation, a plan was developed which selected elements from most of the individual alternatives.

This report summarizes the facilities plan. More detailed information is available in a series of workpapers under separate cover.

Future Activities

Detailed analysis of site locations and environmental assessment must be completed as each individual facility is constructed.

CHAPTER 2

FUTURE FLEET ESTIMATES

This chapter describes one of a series of work tasks completed to determine the optimum size, location, and number of bus maintenance and storage facilities. Future fleet size estimates were made for the entire suburban area. This includes the area now served by private carriers under a contract with the RTA. However, the estimation procedure and results discussed in this chapter are for the transit bus fleet only. The estimate of the paratransit vehicle fleet was prepared separately and will be discussed later.

Process

The size of the future transit bus fleet in the suburban area was estimated for the years 1990 and 2000. Also, the impact of an energy constrained environment (limited energy or drastically higher prices) was analyzed. The following process was utilized.

1) The present suburban bus fleet (including those vehicles now operated by contract carriers) was allocated to townships based on the percentage of route miles in each township.

2) Regression analysis defined relationships between existing fleet size and township population and employment information.

3) Estimates of future township population and employment were used to estimate the future bus fleet.

4) Information from the Chicago Area Transportation Study (CATS) on the impact of limited or high priced gasoline was used to develop township by township fleet estimates assuming an energy constrained future.

Existing Bus Fleet

In order to project future size and distribution of the suburban bus fleet, a complete inventory of the existing fleet was needed. For each bus route, the peak vehicle requirement, route length in miles, and the townships through which the route passed were identified. The peak vehicle fleet was allocated to townships based on the percentage of route miles in each township. Figure 2 presents a summary of the existing fleet distribution.

Future Fleet Requirements

In order to project future fleet size, two factors were considered: demographic changes in the region and increased demand for bus service resulting from scarce or high priced energy. The impact of demographic change was evaluated through the use of regression analysis. The analysis found a significant relationship between township population and employment and the number of buses serving that township. Future

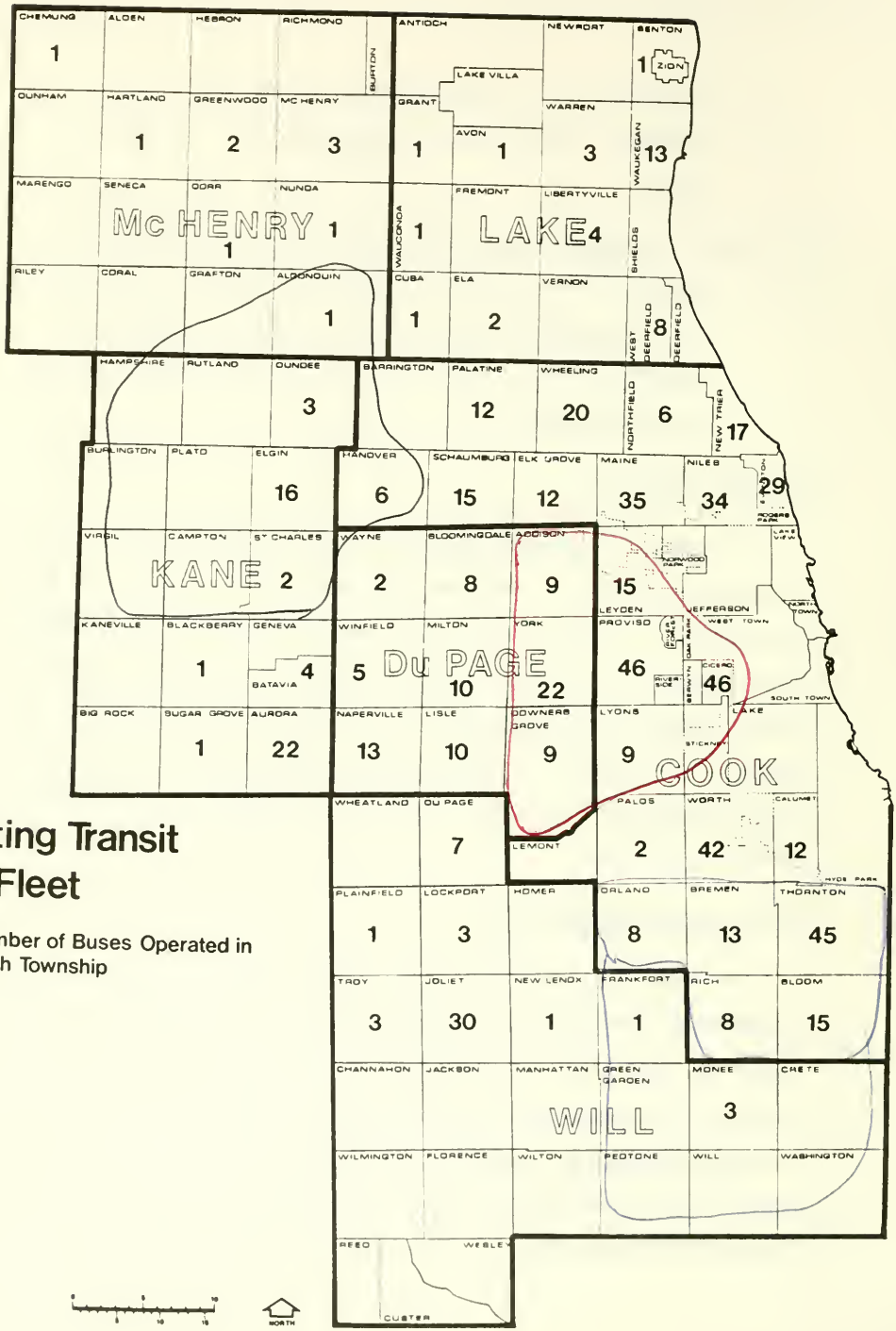

Figure 2

Existing Transit Bus Fleet

00 – Number of Buses Operated in Each Township

population and employment projections were supplied by the Northeastern Illinois Planning Commission.

The impact of scarce or high priced energy was evaluated by the Chicago Area Transportation Study. This analysis considered the impact of a scenario in which the price or availability of fuel would change drastically. The price utilized was $3.00 per gallon for gasoline in 1979 dollars.

Table 1 presents a summary of the fleet estimates. In this table, the township estimates have been summarized by county or section of county. As may be noted from the table, the existing fleet requirement of 675 buses is projected to increase to 965 by 1990 and 1135 by the year 2000 for the normal energy scenario. The restricted energy scenario projection is for a fleet of 1370 vehicles in the year 2000.

The "Year 2000 Normal Energy Scenario" was selected as the design volume to be used by the study. The development of bus garage facilities take a number of years. Therefore, the 20 year planning horizon of this target year is desirable. Of course, the recommended facilities do not have to be built to to the year 2000 target immediately but can be developed incrementally.

Figure 3 presents the year 2000 township bus fleet projections.

Additional information on future fleet estimates may be found in the Fleet Estimates workpaper.

TABLE 1 BUS FLEET ESTIMATES

		Normal Energy Scenario		Restricted Energy Scenario[5]
	1980[5] Actual Fleet	1990 Projected Fleet	2000 Projected Fleet	2000 Projected Fleet
Northern Cook[1]	121.5	145	155	180
Northwest Cook[2]	63.5	90	105	135
West Cook[3]	115.5	150	165	190
South Cook[4]	144.2	200	230	270
Lake	35.3	70	100	120
McHenry	9.0	20	25	30
Kane	49.0	70	85	105
DuPage	87.5	140	170	210
Will	49.2	80	100	130
TOTAL	675	965	1,135	1,370

1. Includes the following townships: New Trier, Northfield, Maine and Niles.
2. Includes the following townships: Wheeling, Palatine, Barrington, Hanover, Schaumburg and Elk Grove.
3. Includes the following townships: Leyden, Proviso, West Towns, Lyons.
4. Includes the following townships: Palos, Worth, Calument, Orland, Bremen, Thorton, Rich, Bloom and Lemont.
5. Includes peak vehicle requirements plus spares (15% of peak vehicle needs).

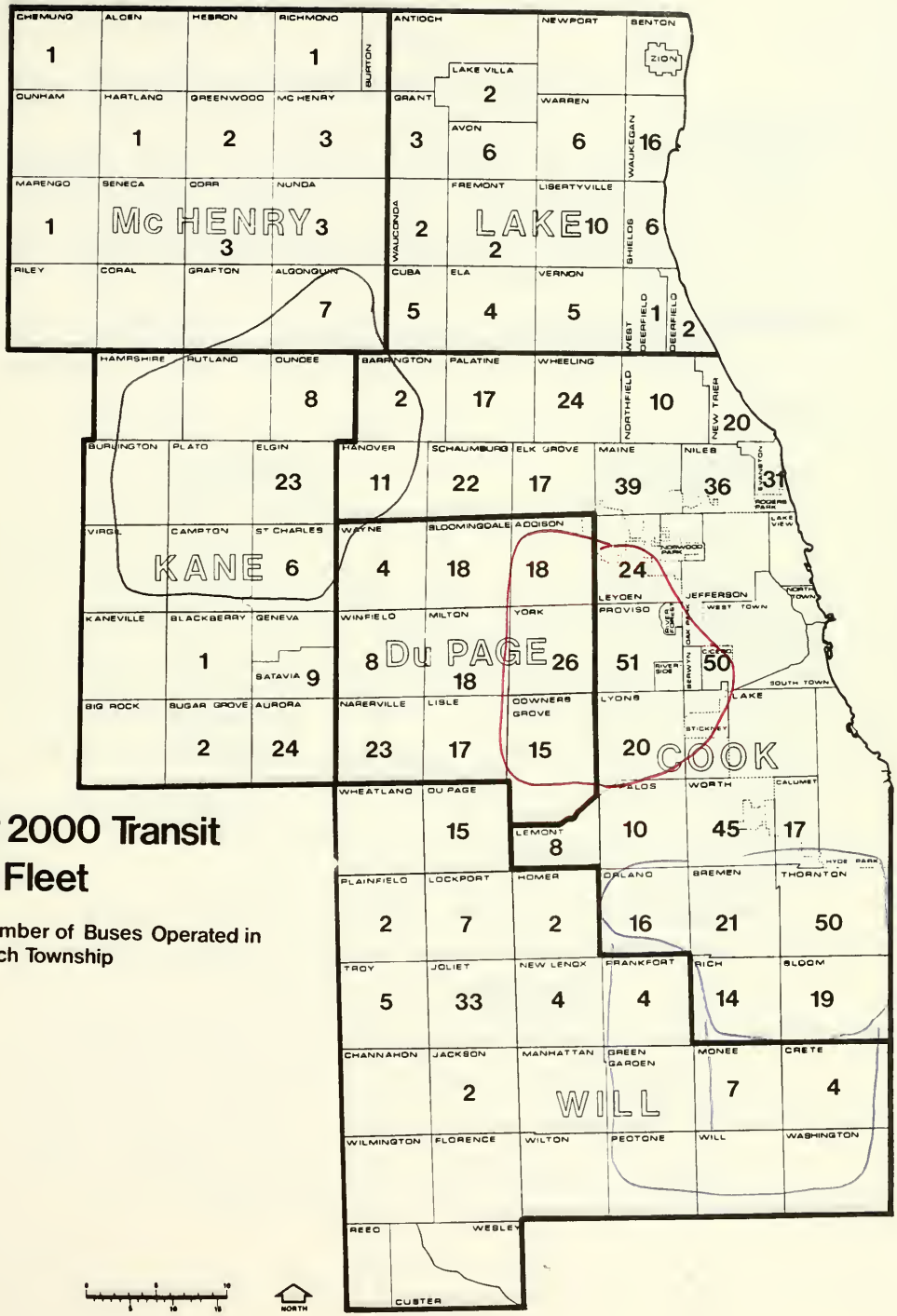

Figure 3

Year 2000 Transit Bus Fleet

00 - Number of Buses Operated in Each Township

CHAPTER 3

EXISTING CONDITIONS

The analysis of conditions at the existing suburban facilities included both an inventory of all space available and a comparison of this space with desirable standards. Existing facility locations are illustrated in Figure 4. In addition, private carriers under contract to the RTA and the Chicago Transit Authority provide services in the suburban area.

Existing Facilities

On-site inspections were conducted at each facility illustrated in Figure 4. The inventory was conducted to determine the size and condition of each facility. In order to obtain the same information at each facility, a standard inventory form was developed. Table 2 presents the Inventory Checklist. The following summaries present brief comments about each facility. Additional facility information is included in the Facilities Inventory workpaper.

Aurora. Aurora Transit System's facility is poorly designed. The maintenance area, parts room and maintenance manager's office should be relocated to be in close proximity. The bus washer exit lane should be enclosed to allow year round bus washing. Since the site is shared with the Aurora Public Works Department, any future expansion of the facility at the present location must be carefully coordinated with that department.

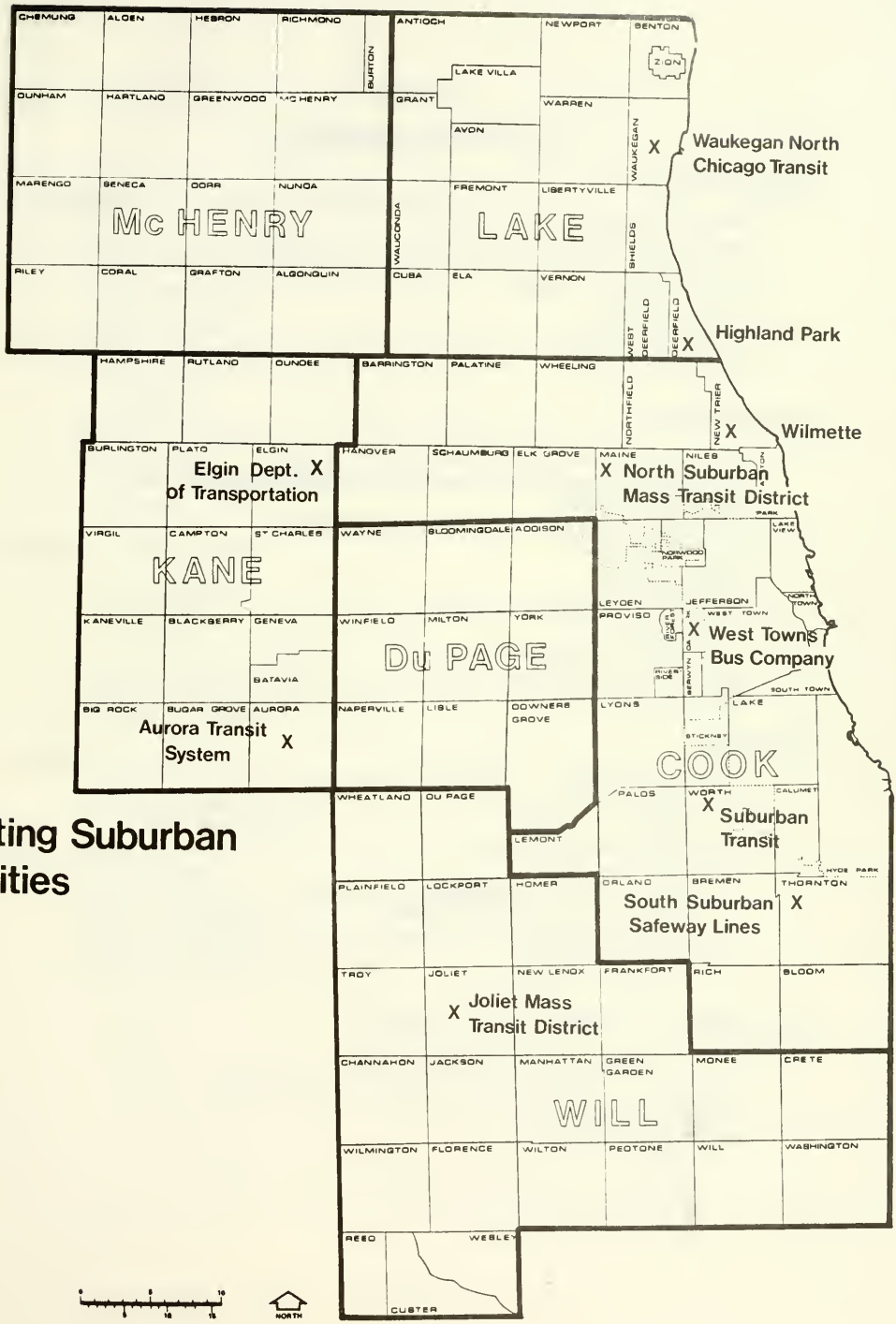

Figure 4

Existing Suburban Facilities

TABLE 2

INVENTORY CHECKLIST

ADMINISTRATION

- General Manager's Office
- Assistant Offices
- Secretaries and Clerks offices
- Lost and Found Area
- Public Space
- Rest Rooms
- Office Storage
- Conference Room

TRANSPORTATION

- Transportation Superintendent's Office
- Assistant Transportation Superintendent's Office
- Dispatch Office
- Other Offices (clerks and supervisors)
- Training Room
- Waiting Room
- Report Room
- Lunch and Recreation Room
  - lockers
  - vending machines
- Operator Rest Rooms
- Storage Area

SERVICING

- Fueling Islands
  - number of islands
  - length of lane
- Vaulting Area (Farebox)
- Exterior Washing
  - automatic bus washers
  - water reclamation systems
  - exterior underground heaters
- Bus Interior Wash
  - cyclone cleaners

MAINTENANCE - INSPECTION AND REPAIR

- Maintenance Supervisors Office
- Assistant Maintenance Supervisor's Office
- Foreman's Office
- Maintenance Bays
  - lifts
  - pits
  - overhead dispensing units

TABLE 2

INVENTORY CHECKLIST (cont'd)

MAINTENANCE - INSPECTION AND REPAIR

- Air Conditioning Repair Equipment
- Body Repair Facilities
- Painting Facilities
- Parts Storage
- Tire Storage
- Battery Storage
  - emergency eye wash
  - shower
- Bench Room
- Tool Cart Room
- Lunch Room
- Locker and Rest Room
  - shower

VEHICLE STORAGE AREA

- Bus Parking
  - inside
  - outside
- Bus Staging Area
- Returned Bus Reservoir
- Employee Parking
- Public Parking

MISCELLANEOUS

- Utility Vehicles
  - number and type
- Employees
- Ventilation
- Underground Fuel and Oil Storage
- Total Land Area
- Total Building Space
- General Comments

Elgin. The Elgin facility is severely overcrowded. The lack of space and equipment limits their ability to perform maintenance tasks. No adjacent land is available for expansion. Therefore, relocation to a larger facility is essential.

Joliet. Joliet Mass Transit District is adequately maintaining their vehicles in a cramped and poorly designed facility. The garage is too small and has a layout which causes tasks to be performed inefficiently. Adjacent land appears to be available for expansion, as well as a vacant building across the street.

Waukegan-North Chicago Transit. The Waukegan-North Chicago Transit facility lacks amenities and some necessary equipment. It has a poor vehicle servicing area, no bus washer, and inadequate storage area. WNCT property is large enough for considerable on-site expansion.

North Suburban Mass Transit District. The North Suburban Mass Transit District facility is severely overcrowded. The lack of space is causing inefficient use of available space. Maintenance bays are being used for parts storage. Office and locker/wash room facilities are inadequate. Absolutely no additional bus parking space is available. It does not appear that adjacent land could be acquired for expansion. It is basically a sound facility except that it is presently "overutilized".

South Suburban Safeway Lines. South Suburban Safeway Lines facility is severely overcrowded. Many buses are now parked at a remote location. Enclosed storage space is very limited. The building is poorly designed for a major transit facility. The City of Harvey views the facility as a major impediment to downtown renewal. No space is available for expansion. Therefore, relocation to a larger facility is essential.

Suburban Transit. Although the Suburban Transit facility is relatively new and in good condition, it is also overcrowded. However, lack of adequate space has had minimal impact on efficient operations. A small amount of adjacent land is available for expansion.

West Towns. West Towns is housed in an old building, originally constructed as a street car barn. The building is not structurally sound. There is a severe shortage of bus storage space, especially since one of the storage buildings collapsed after a heavy winter snow. Adjacent land would be most difficult to acquire. Therefore, relocation to a larger facility is essential.

Highland Park. Highland Park Transit benefits from sharing their facility with the Highland Park Public Works Department. They are able to share tools and equipment with that department. Highland Park lacks adequate vehicle servicing and storage area. However, adequate land appears to be available for future expansion.

Wilmette. By sharing a building with the Wilmette Public Works Department, Wilbus is also able to share facilities. However, the Wilbus operations suffers from having its office, maintenance, storage, and servicing areas dispersed throughout the facility. Wilmette needs improved servicing and maintenance areas and additional enclosed storage space. Adequate land appears to be available.

Standards

Space and labor standards were developed for use in the study. The standards were used to evaluate existing facilities as well as to define labor and space needs for new facilities. Many sources were used to develop these space and labor standards. An especially important one was a handbook developed by the Mitre Corporation for the Urban Mass Transportation Administration based on a survey of 55 transit properties.

The standards developed were dependent upon the sets of maintenance activities to be performed within the facility. As will be defined more fully later in the "Alternatives" chapter, two types of garage facilities were evaluated. An "Inspection Garage" was defined as a facility that is responsible for vehicle storage and daily operation. The inspection garage would provide daily servicing, running repairs, and periodic maintenance. A series of inspection facilities would be combined into a larger unit called an operating division. One of the garages in the division would function as the main or "Division Garage".

A division garage would not only be responsible for all of the inspection functions listed above but would also do infrequent or major repairs not handled at the inspection garages. The division garage would house the major administrative functions for the entire division. Tables 3 and 4 summarize staffing requirements for inspection and division garages of varying sizes exclusive of bus drivers. As illustrated in the tables, a 100 bus inspection garage would require a staff of approximately 29, whereas a 100 bus division garage would require a staff of approximately 53.

Paratransit Service

The Regional Transportation Authority has recently initiated a Paratransit Program. The method of vehicle storage and maintenance used by this program is directly related to the RTA's facilities requirements. At the present time, the Paratransit services are administered through contracts between the RTA and sponsoring communities. This arrangement puts the burden of vehicle storage and maintenace on the sponsoring community. If at some future time the RTA were to assume direct operations of these Paratransit services, vehicle storage and maintenance would become an RTA responsibility.

TABLE 3
DIVISION FACILITY STAFFING GUIDLINES

TYPE OF STAFF	NUMBER OF VEHICLES							
	30	60	100	125	150	200	250	300
Administration								
General Manager	1	1	1	1	1	1	1	1
Assistant General Manager	1		1	1	1	1	1	1
Office Manager			1	1	1	1	1	1
Personnel Manager			1	1	1	1	1	1
Office Manager/ Personnel Manager		1						
Accountant			1	1	1	1	1	1
Accounting Clerk		1	1	1	1	1	1	1
Payroll/Insurance Clerk		1	1	1	1	1	1	1
General Clerk	1							
Typist/Receptionist	1	1	1	2	2	2	3	3
Executive Secretary			1	1	1	1	1	1
Transportation								
Superintendent		1	1	1	1	1	1	1
Assistant Superintendent			1	1	1	1	1	1
Dispatcher	3	3	3	3	3	3	3	3
Instructor	1	1	1	1	1	1	1	1
Road Supervisor	1	2	2	3	3	4	5	6
Transportation Clerk		1	1	1	1	1	1	1
Maintenance								
Superintendent		1	1	1	1	1	1	1
Assistant Superintendent			1	1	1	1	1	1
Foreman	2	3	4	5	5	5	5	6
Mechanic	6	12	20	25	30	40	50	60
Servicer	3	5	6	8	9	12	15	18
Parts Room Clerk		2	2	2	2	3	3	3
Maintenance Clerk		1	1	1	1	1	1	1
TOTAL	20	37	53	63	69	84	99	114

TABLE 4

INSPECTION FACILITY STAFFING GUIDELINES

TYPE OF STAFF	NUMBER OF VEHICLES							
Administration	30	60	100	125	150	200	250	300
Manager	1	1	1	1	1	1	1	1
Secretary	1/2	1	1	1	1	1	1	1
Transportation								
Dispatcher	2	3	3	3	3	3	3	3
Road Supervisor	1	2	2	3	3	4	5	6
Maintenance								
Foreman	2	3	4	5	5	5	5	6
Mechanic	3	6	10	13	15	20	25	30
Servicer	3	5	6	8	9	12	15	18
Parts Room Clerk		2	2	2	2	3	3	3
TOTAL	12 1/2	23	29	36	39	49	58	68

Because of the uncertainties associated with the Paratransit Program, this study assumed that vehicle storage and daily maintenance will continue to be the responsibility of the sponsoring community. Therefore, the basic plan for storage and maintenance has been developed for the transit bus fleet. However, it appears likely that the RTA would want to assist the paratransit communities in major maintenance activities. Therefore, the requirements of paratransit fleet for major maintenance will be included in the recommended plan.

CTA Service

The Chicago Transit Authority completed a Facilities Plan in 1977. The conclusion of that study was that the CTA system will remain in a static condition throughout the near future. Therefore, a rehabilitation and renewal program was developed to upgrade but not expand the CTA garage system. The recommendations of the CTA plan were reviewed in detail and were found to be consistent with the plans being developed by the RTA.

However, on the fringe of the CTA service area it appears that several routes could be readjusted to minimize deadhead cost and provide a more rational system. In general, these service modifications appear to balance well between the CTA and Suburban Carriers.

The one possible exception appears to be the Evanston service. This service is now operated by the CTA and involves 22 peak hour buses. As a later chapter indicates, a new garage facility on the North Shore appears justified. It would be desirable to operate the Evanston service from this new facility. Therefore, continuing RTA/CTA Operations Planning will have to take place as the final plans for the new North Shore facility are completed.

Figure 5 identifies the existing CTA garage facilities.

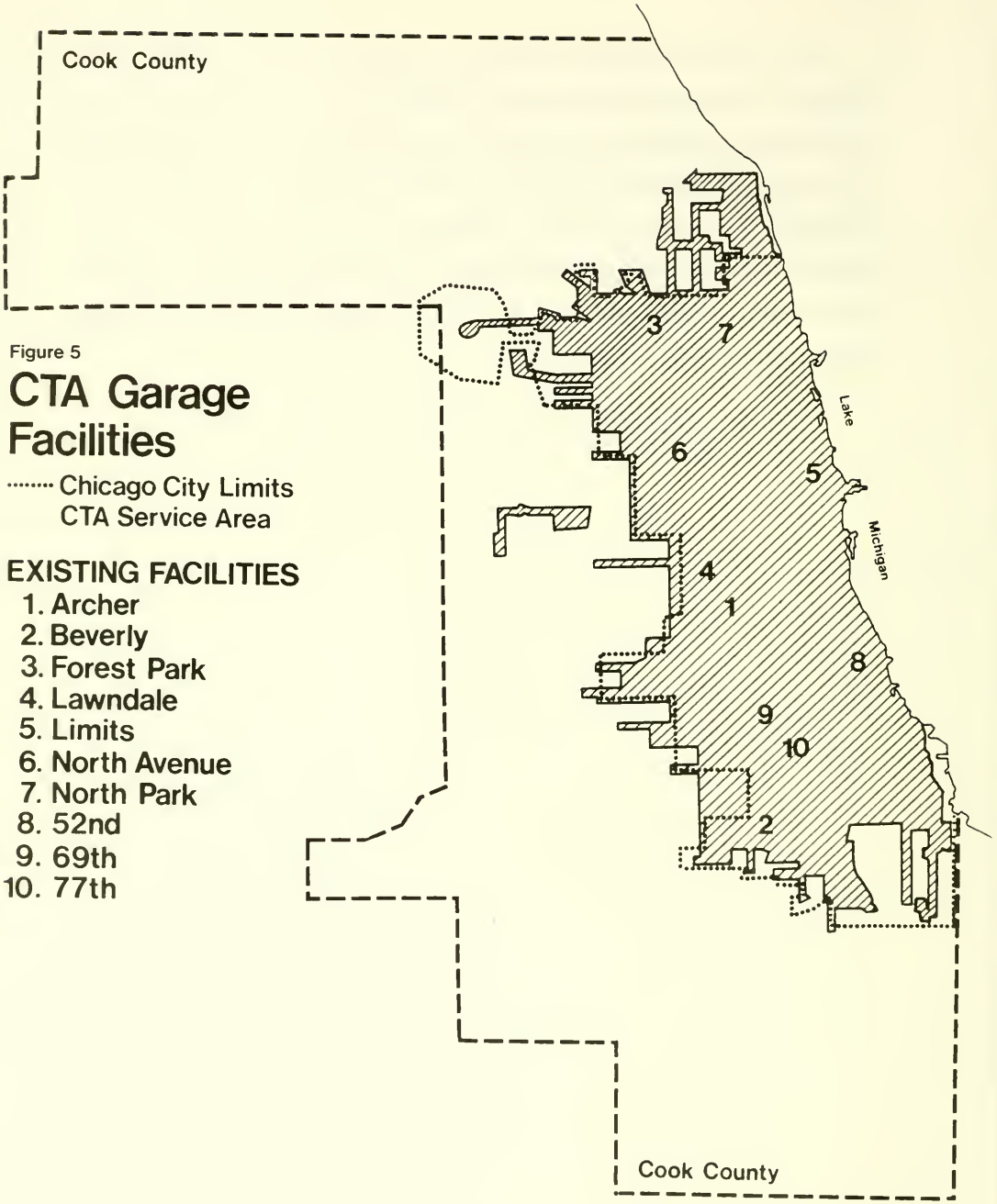

Figure 5

CTA Garage Facilities

····· Chicago City Limits
CTA Service Area

EXISTING FACILITIES

1. Archer
2. Beverly
3. Forest Park
4. Lawndale
5. Limits
6. North Avenue
7. North Park
8. 52nd
9. 69th
10. 77th

CHAPTER 4

ALTERNATIVES

The development of a bus facilities plan for an area as large and diverse as Northeastern Illinois is a complex project which requires a systematic evaluation of alternatives. While the alternatives evaluated must present a wide range of development options, they must also offer pragmatic solutions to the problems facing the region.

Issues

During the initial phases of this study, several basic issues were identified. These issues, in conjuction with the study goals outlined at the beginning of this report provided the basis for alternatives development. The issues include:

1) The degree to which major maintenance and other specialized activities should be centralized.

2) The degree to which service areas effect the size and location of storage facilities.

3) The need for a hierarchy of bus garage facilities. That is, different facilities serving different functions.

4) The degree to which flexibility must be built into the garage system to allow for future uncertainties.

5) The need for maintaining operations activities during plan implementation.

6) The need to strike an economic balance between initial capital expenditures and future operational costs.

The alternatives were structured to allow an evaluation of various operations and maintenance schemes. The alternatives range from a centralized scheme of three major inner-suburban facilities to a very decentralized scheme which evaluated a total of eleven inner-suburban facilities.

Alternatives

Six broad regional alternatives were defined. Each of these alternatives further defined a variety of sub schemes within different parts of the region. By combining these subarea schemes, a total of over one hundred alternatives were evaluated.

A major element of the alternatives had to do with the way in which maintenance activies were carried out. At the present time, maintenance activities vary greatly from one facility to the next. Some facilities repair and rebuild practically all major components while others do little rebuilding.

The development of a region-wide approach to vehicle maintenance will result in a more efficient use of labor and equipment. The region-wide approach will provide all facilities with an access to specialized equipment and labor not possible with today's fragmented system.

Because of the special characteristics of this region, the RTA should be able to develop a three tiered maintenance concept. This system would be composed of Main Shop, Division Garage, and Inspection Garage Facilities.

The core of the maintenance system is the Main Shop. Because of the specialized equipment and labor required, Main Shop functions should be concentrated at one location. There are many reasons for the centralization of heavy rebuilding and shop functions. One of the most important is the ability to apply industrial engineering practices to the operation that would not be possible with smaller facilities. Quality control, concentration of craftsman skills, ability to provide specialized training, reduction of management overhead, and better inventory and stores control are among the more important reasons for centralization of shop functions.

The development of a Main Shop is a complex task. Centralized purchasing and regional distribution system must be established in conjunction with the Main Shop. Therefore, the Main Shop will be the topic of a separate planning report in the second phase of the facilities plan project.

At the other end of the three tiered system is the inspection garage. The inspection garage is the heart of the preventive maintenance program. In this region, the use of inspection garages would allow service areas to be defined that will minimize the rapidly increasing cost of vehicle deadheading. The inspection garage would be responsible for daily

servicing, 6,000 and 12,000 mile inspections, and minor repairs and maintenance.

The second tier facility, or the Division Garage, would provide functions that are more infrequent, time consuming, or that require more specialized equipment and labor than those performed at the inspection garage. The 18,000 mile inspection, major in-frame repairs, and major component exchange are examples of division functions. Table 5 summarizes maintenance activities carried out at each facility type. The division garage would also house most of the administrative staff of the division.

The three tiered maintenance structure should be cost-effective in this region because of the relatively low density of bus services in many suburban areas. The low density causes very large service areas with large subsequent deadhead mileage costs. The following alternatives present a wide range of suburban bus storage and maintenance options. A Chicago Division has been included in each alternative. This division will include the area served by the Chicago Transit Authority. The differences in population density and, therefore, service levels dictate the creation of the separate Chicago Division.

Alternative 1

Alternative 1 presents a very centralized operations scheme. The Suburban Bus Coordination Study, completed during 1977 and 1978 for the RTA, recommended a centralized operations

TABLE 5

MAINTENANCE FUNCTIONS

Main Shop

Engine Overhauls
Component Rebuilding
Major Body Repairs
Painting
Upholstery
Sign Shop
Radiator Repairs
Machine Shop
Specialty Shop
Tire Shop - Regrooving
Central Parts Depot
Mechanic Training Center
Automotive and Support Vehicle Shop

Division Garage

All Functions of an Inspection Garage plus:
18,000 mile Major Inspection
All Major Component Exchange
All Major In-Frame Repairs
Minor Body Work
Brake Relining and Drum Turning
Chassis and Engine Dynamometer Testing
Major Air Conditioning Repair

Inspection Garage

Running Repairs
Daily Servicing
3,000 and 12,000 mile Inspections
Brake Adjustments
Engine Degreasing
Engine Oil Testing
Dynamometer Testing
Minor Air Conditioning Inspection and Repair
Tire Changing

scheme similar to the one outlined in Alternative 1. Under this alternative there would be four suburban operating divisions and eight garage facilities in the region. Figure 6 presents Alternative 1.

North Division. The North Division would serve North Cook County and most of Lake County. It would have a large division garage in North Cook and an Inspection Garage in Waukegan.

West Division. The West Division would serve West Cook County the eastern two-thirds of DuPage County and the Bolingbrook area of Will County. It would have a single division garage located in West Cook County.

South Division. The South Division would serve South and Southwest Cook County and most of Will County. It would have a large division garage in South Cook County and an Inspection Garage in Joliet.

Fox Valley Division. The Fox Valley Division would contain all of McHenry and Kane Counties and small portions of Lake, Cook and DuPage Counties. It would be served from a division garage in Elgin and inspection garages in Aurora and McHenry County.

Alternative 2

Alternative 2 presents a slightly less centralized plan than Alternative 1. As the review of the existing garage

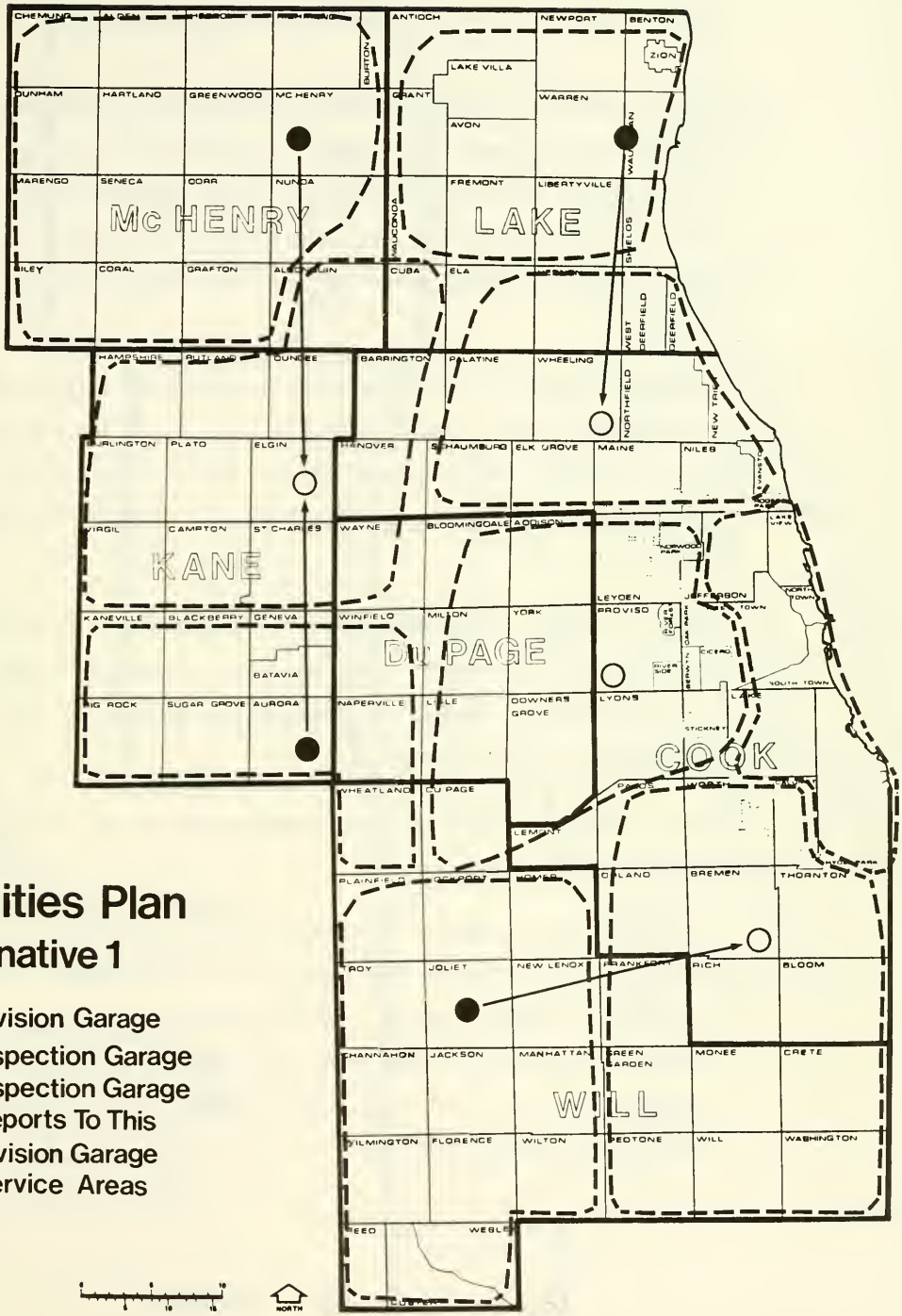

Figure 6

RTA Facilities Plan

Alternative 1

- ○ Division Garage
- ● Inspection Garage
- → Inspection Garage Reports To This Division Garage
- – – Service Areas

facilities indicated, the NORTRAN and Suburban Transit facilities are basically sound buildings. Alternative 2 allows for the continued use of these facilities. Five suburban operating divisions are envisioned in this alternative. A total of 11 facilities would be required. Figure 7 presents Alternative 2.

NORTRAN Division. The location and capacity of the existing NORTRAN facility indicates the need for a new facility to the east. The division garage would be the existing NORTRAN facility and a new North Shore inspection garage would be built.

North Division. The North Division would serve Northwest Cook County and most of Lake County. It would be served from a division garage in Northwest Cook County and an inspection garage at Waukegan.

West Division. Same single garage division as in Alternative 1.

South Division. South Division would serve South and Southwest Cook County and most of Will County. The existing Suburban Transit facility would function as an inspection garage for Southwest Cook County. The division garage would be in South Cook County with a second inspection garage in Joliet.

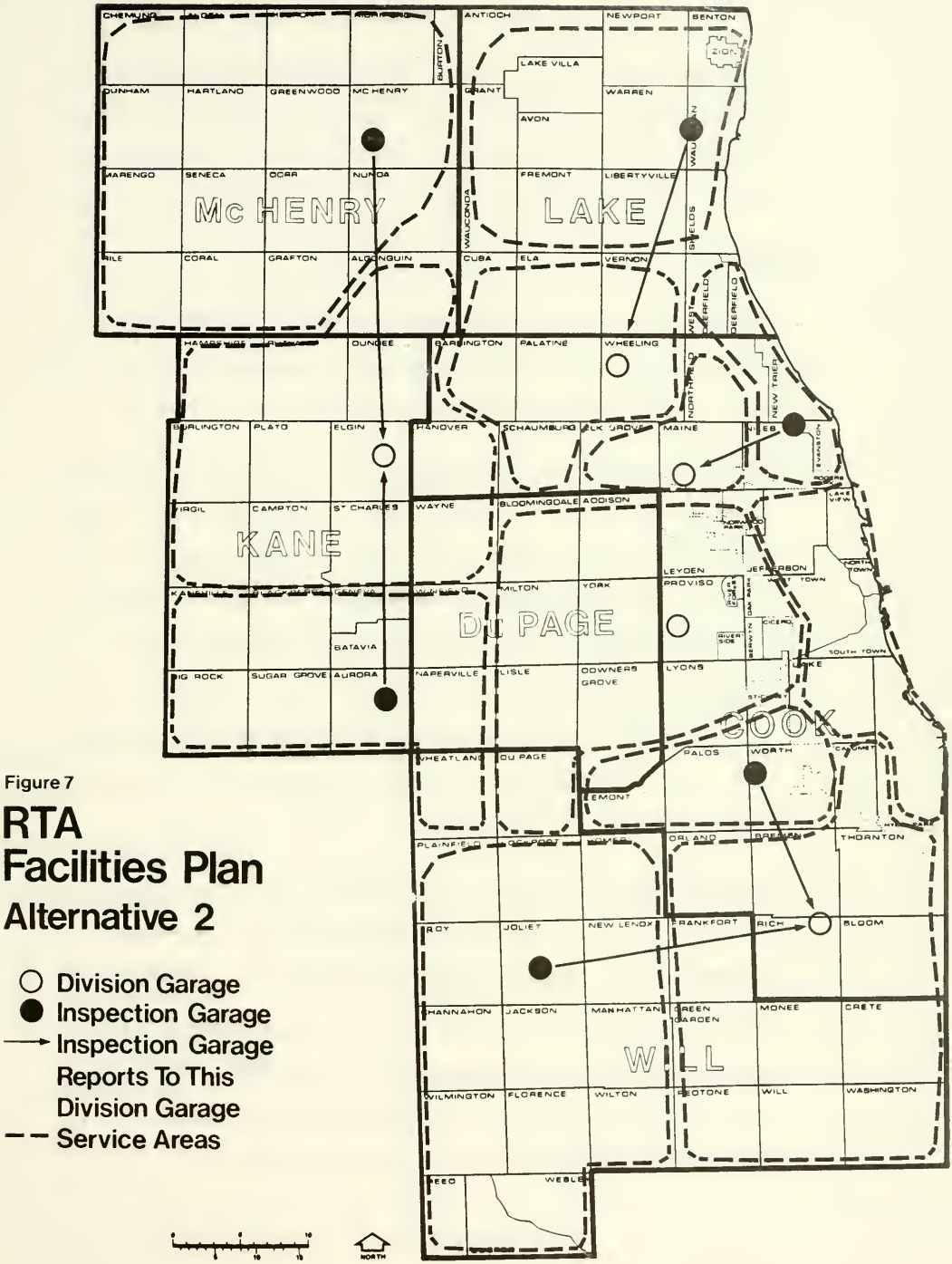

Figure 7

RTA Facilities Plan

Alternative 2

- ○ Division Garage
- ● Inspection Garage
- → Inspection Garage Reports To This Division Garage
- – – Service Areas

Fox Valley Division. Same three garage division as in Alternative 1. However, the service area for the Elgin division garage would be slightly smaller due to the Northwest Cook County Facility.

Alternative 3

Alternative 3 tests the concept of multiple divisions and facilities. It has seven suburban divisions and six inspection garages. Figure 8 illustrates Alternative 3.

North Division. In this alternative the existing Highland Park facility is reused. The North Division serves Northwest Cook County and all of Lake County. The division garage is in Northwest Cook County and the inspection garages are in Waukegan and Highland Park.

NORTRAN Division. In Alternative 3 the NORTRAN Division is composed of a division garage at the existing NORTRAN site and an inspection garage serving the North Shore area.

West Division. The West Division has a division garage serving West Cook and East DuPage Counties. The remaining two-thirds of DuPage County is served from an inspection garage.

South Division. The three garage division in Alternative 2 has been reduced to a two garage division by the separation of Joliet into its own division.

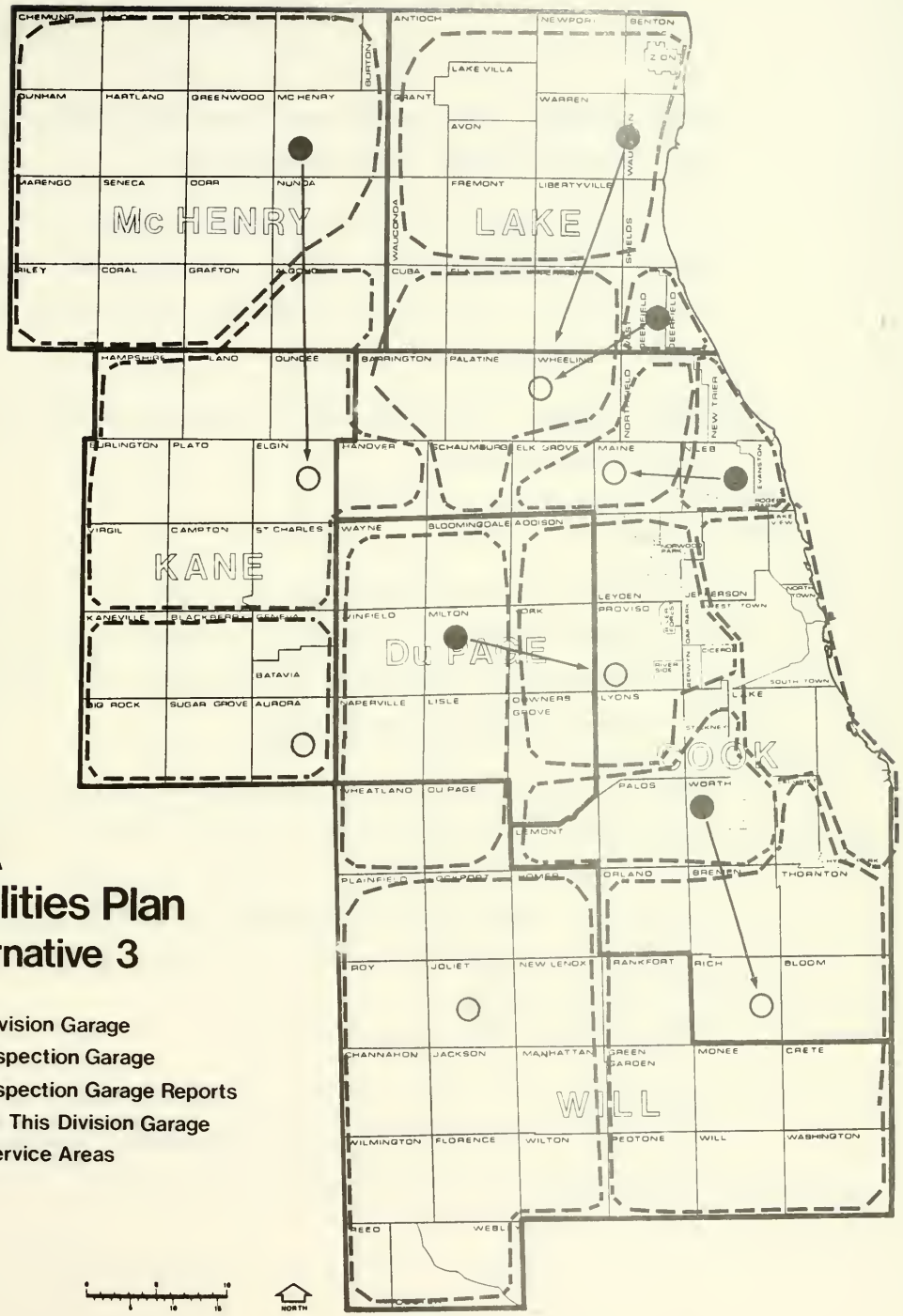

Figure 8

RTA Facilities Plan Alternative 3

- ○ Division Garage
- ● Inspection Garage
- → Inspection Garage Reports To This Division Garage
- – – Service Areas

Joliet Division. The Joliet area would be served by a single division garage in this alternative.

Fox Valley Division. The Fox Valley Division has been reduced to a two garage division by the separation of the Aurora service. The division garage is in Elgin with the inspection garage in McHenry County.

Aurora Division. The Aurora area would be served by a single division garage.

Alternative 4

Alternative 4 has six suburban operating divisions with a total of fourteen garages. It envisions a further decentralization with additional facitlities in Wilmette, and DuPage County. Figure 9 presents alternative 4.

NORTRAN Division. The NORTRAN Division in this alternative serves the same overall area as Alternative 3. However, the existing Wilmette facility is reused. The division, is composed of the NORTRAN division garage and the Wilmette and North Shore inspection garages.

North Division. Same as Alternative 3.

West Division. The West Division serves West Cook County and the eastern one-third of DuPage County from a single division garage in West Cook County.

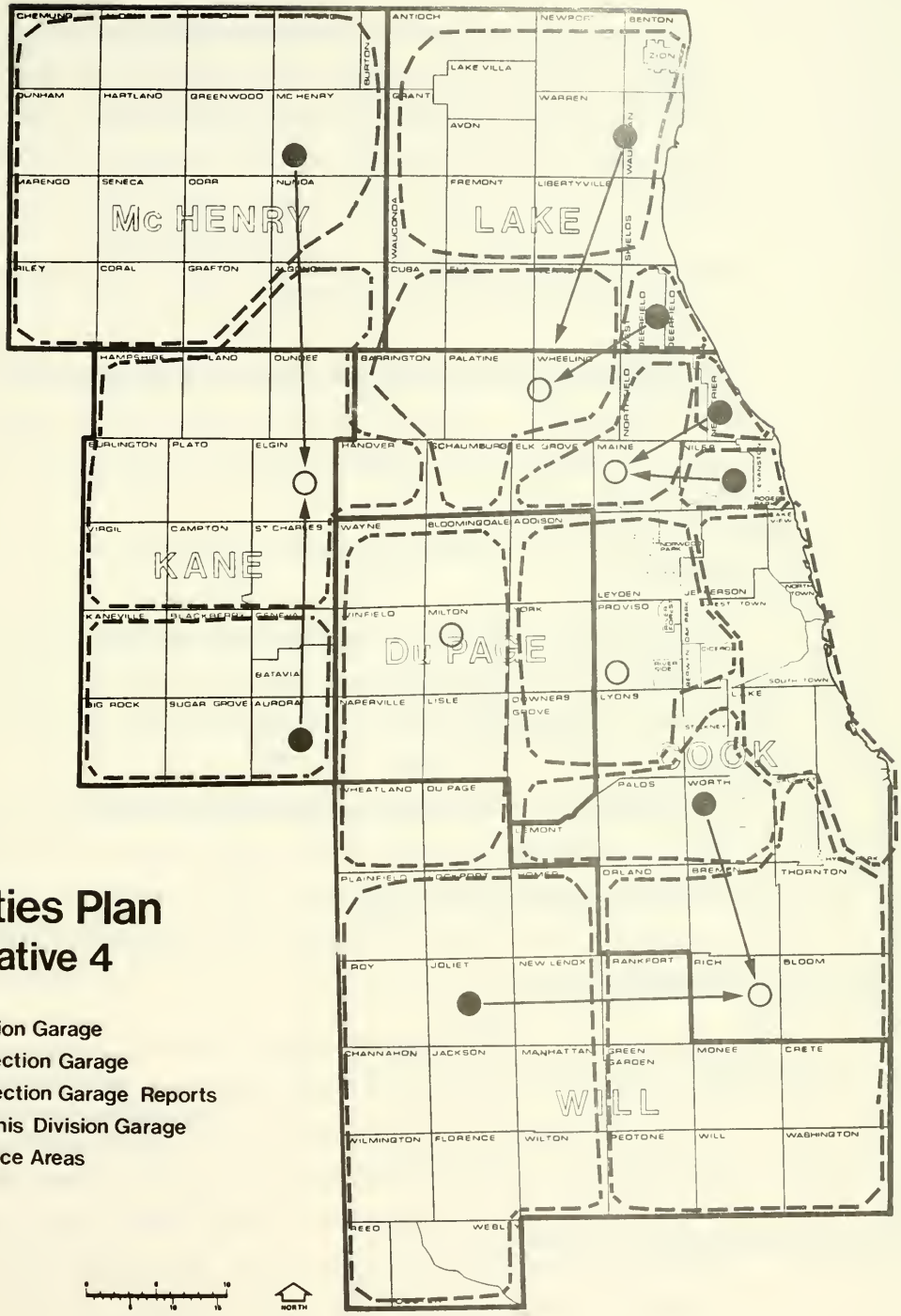

Figure 9

RTA Facilities Plan

Alternative 4

- ○ Division Garage
- ● Inspection Garage
- → Inspection Garage Reports To This Division Garage
- – – Service Areas

DuPage Division. The DuPage Division serves the western two-thirds of DuPage County and the Bolingbrook area of Will County from a single division garage in DuPage County.

South Division. Same three garage division as in Alternative 2.

Fox Valley Division. Same basic three garage division as in Alternative 2. However, Aurora service area is smaller due to existance of DuPage Division which serves the Naperville area.

Alternative 5

Alternative 5 presents a less centralized alternative. Four suburban divisions and eleven inspection garages make up this fifteen garage alternative. Figure 10 presents Alternative 5.

North Division. Alternative 5 presents a division which serves North and Northwest Cook County and Lake County from a division garage in Northwest Cook. Four inspection facilities are located in Waukegan, Highland Park, North Shore and NORTRAN.

West Division. The overall service area of the West Division is the same as in Alternatives 3 and 4. However, it is now a three garage division with the division garage in West Cook County and two inspection garages in DuPage County. One of the inspection garages would serve the heavy concentration of services in the Naperville, Lisle, Woodridge, and Bolingbrook areas.

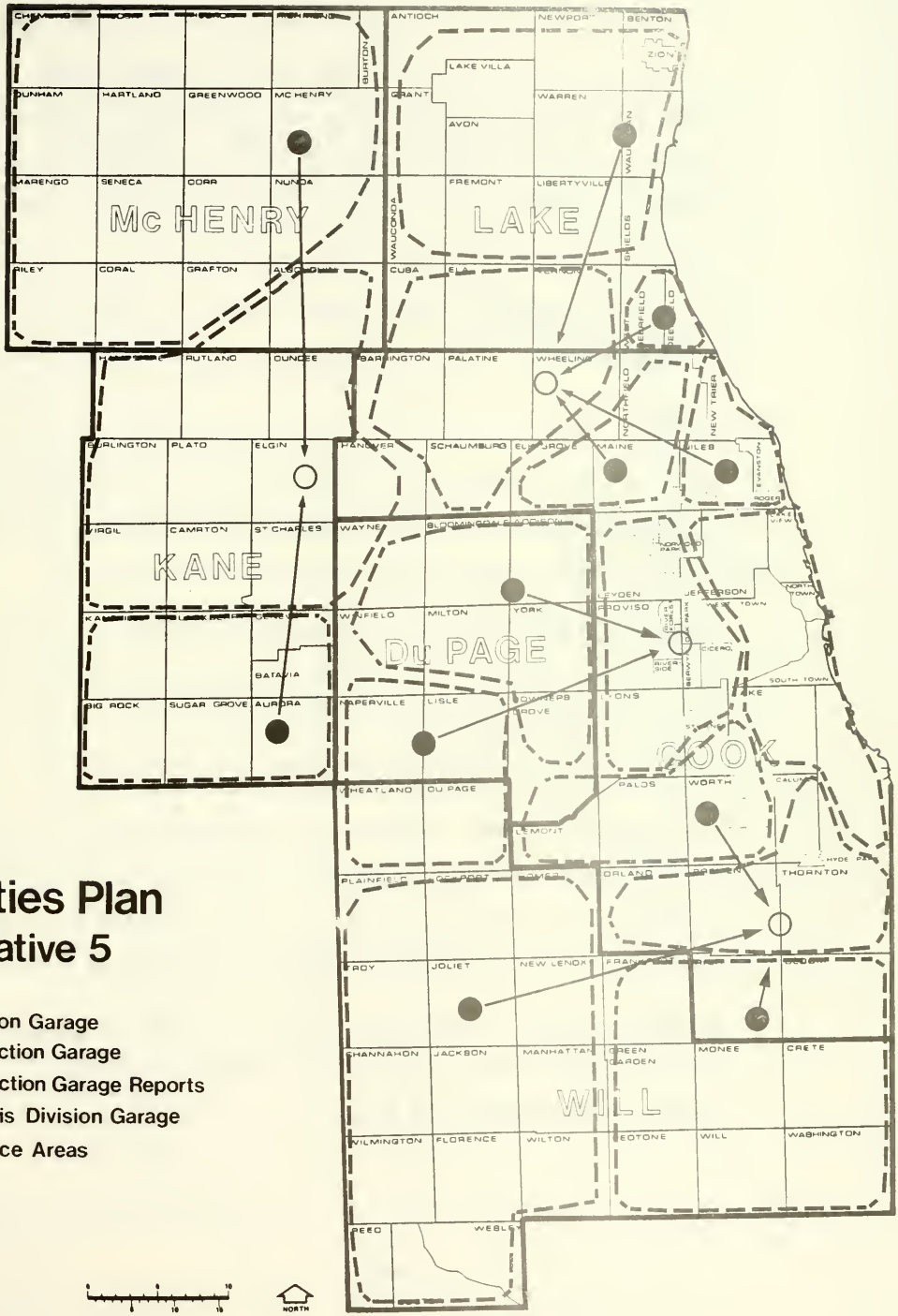

Figure 10

RTA Facilities Plan

Alternative 5

- ○ Division Garage
- ● Inspection Garage
- → Inspection Garage Reports To This Division Garage
- — — Service Areas

South Division. The South area is served from a division garage in South Cook County and three inspection facilities in Southwest Cook (Suburban Transit), South Cook and Joliet.

Fox Valley Division. Same three facility division as in Alternative 4.

Alternative 6

There are two further modifications tested in Alternative 6. This alternative has five suburban division and eleven inspection garages. Figure 11 illustrates Alternative 6.

North Division. As in Alternative 4, the Wilmette and North Shore inspection garages are separate facilities. In this Alternative, as in Alternative 5, the single division garage remains in Northwest Cook County.

West Division. The West Division of Alternative 5 has been divided into two divisions. The West Division is served from a division garage in West Cook County. The remaining area is served by a DuPage Division.

DuPage Division. The DuPage Division serves DuPage County from a division garage in Central DuPage and an inspection garage in the Naperville area.

South Area. Same as Alternative 5.

Fox Valley. Same as Alternative 4.

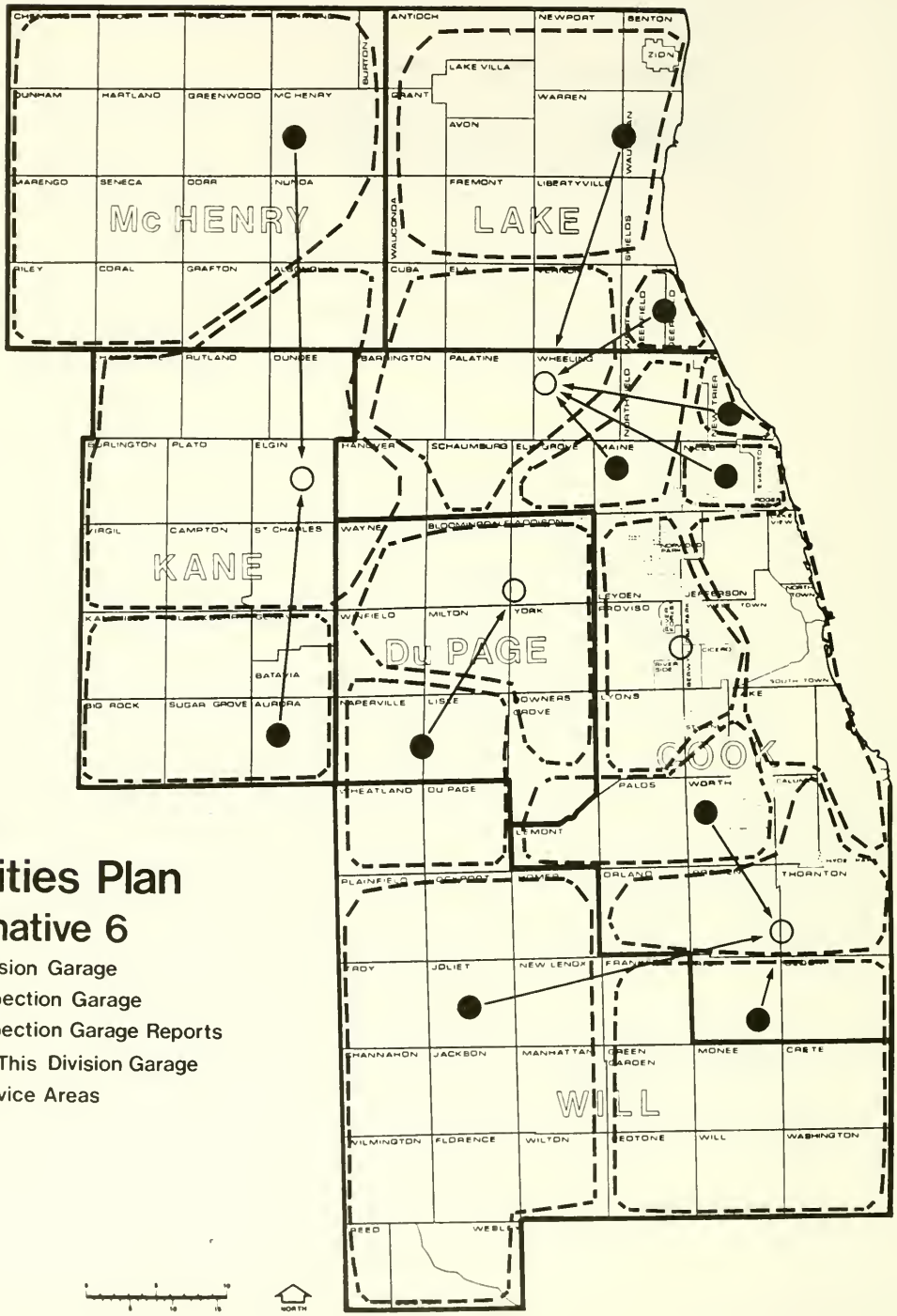

Figure 11

RTA Facilities Plan

Alternative 6

- ○ Division Garage
- ● Inspection Garage
- → Inspection Garage Reports To This Division Garage
- – – Service Areas

CHAPTER 5

EVALUATION OF ALTERNATIVES

This chapter summarizes the results of the evaluation of alternatives defined in Chapter four. The factors included in the evaluation fall into one of three categories 1) Capital Costs, 2) Operating Costs, and 3) Non Monetary Factors. Capital costs include land acquisition, construction costs, and equipment costs. Operating costs include those factors that vary with the number and type of garage facilities. These include deadhead mileage and facility labor costs. The cost of the revenue service (driver, fuel, parts, insurance, etc.) would not be expected to vary with changes in the facilities scheme being utilized. Therefore, direct cost of revenue service was not included in this comparative analysis. Finally, non-monetary factors include such considerations as ease of implementation, phasing opportunities, and system compatibility.

Capital Costs

Capital Costs include land acquisition, construction costs and equipment costs.

Land. The cost and availability of suitable sites for bus maintenance facilities varies over the RTA region. In addition to availability, the potential for perceived or actual negative environmental impacts of a bus maintenance

facility will reduce the choice of sites in the region. Table 6 summarizes average land cost for industrial sites throughout the region.

Table 6

LAND COSTS

Area	Industrial Land Price Range Per Acre*
City of Chicago	$60,000 - $240,000
Suburban Cook County	
North	$43,000 - $180,000
West	$65,000 - $ 86,000
South	$10,000 - $ 86,000
DuPage County	$10,000 - $160,000
Kane County	$22,000 - $ 85,000
Lake County	$20,000 - $ 85,000
McHenry County	$18,000 - $ 85,000
Will County	$ 5,000 - $ 60,000

* Based on land price averages for vacant land of individual industrial parks.

Unit Construction Costs. For preliminary cost estimates, the cost of garage construction was considered on the basis of broad functional categories. The categories considered included office space, bus storage, bus servicing, inspection, maintenance, circulation and outside parking. These estimates included some built in equipment, such as lifts, bus washers and fueling islands.

Table 7

UNIT CONSTRUCTION COST

Functional Category	Cost Per Square Foot
Office Space	$ 50
Bus Servicing	94 - $118*
Inspection	50
Maintenance	55 - 90*
Inside Storage	40
Inside Circulation	40
Outside	
Bus Storage	$ 6
Circulation	6
Auto Parking	3
Walkways	3
Landscaping	3

* The estimates for cost per square foot of these functional areas exclusive of equipment is $45.

Facility Space Requirements. Many sources of information were available to aid in the development of space requirement guidelines for the various functional areas of a facility. However, spatial requirements varied greatly from one source to the next.

An important source of spatial requirement information was Bus Maintenance Facilities: A Transit Management Handbook. This handbook was prepared for the Urban Mass Transportation Administration by the Mitre Corporation. This report developed guidelines based on a survey of 55 transit properties with fleets of 11 to 4300 buses.

Tables 8 and 9 contain a listing of space requirements for the various facility functions for division and inspection facilities of various sizes. These requirements served as guidelines in the assessment of the existing facilities as well as in the calculation of construction cost estimates for new facilities.

Table 8

DIVISION FACILITY SPACE GUIDELINES
(Square Feet)

Functional Areas	100 Buses	125 Buses	150 Buses	200 Buses	250 Buses	300 Buses
Administration	2055	2180	2180	2180	2310	2310
Transportation	5550	6640	7730	10035	12350	14520
Servicing	7875	7875	7875	8485	9335	12910
Light Maintenance	11430	14085	17760	20590	26730	29720
Heavy Maintenance	21275	24950	30970	40665	50410	57770
Vehicle Storage	59600	74000	88400	117600	146800	176000
Inside Circulation	13040	16560	21120	26080	34160	40160
Outside Circulation and Parking	119555	144660	166280	218210	259605	300265
TOTAL	240380	290950	342315	443845	541700	633655

Table 9

INSPECTION FACILITY SPACE GUIDELINES
(Square Feet)

Functional Areas	30 Buses	60 Buses	100 Buses	125 Buses	150 Buses
Administration	225	225	225	225	225
Transportation	1915	3230	5050	6140	7230
Servicing	6410	6410	7875	7875	7875
Light Maintenance	4625	8290	10790	13390	16975
Vehicle Storage	18080	35760	59600	74000	88400
Inside Circulation	3810	8655	13040	16560	21120
Outside Circulation and Parking	45300	74400	111230	135935	158740
TOTAL	80365	136970	207810	254125	300565

Equipment. The equipment requirements of bus maintenance facilities are directly related to the size and activities of the facility. As previously described, two types of bus facilities were considered for inclusion in the overall Facilities Plan: Inspection and Division Garages. A summary of the type and approximate cost of the equipment required for the inspection and division garages was prepared.

Operating Costs

Operating Costs evaluated included those factors expected to vary based on number and type of garage facilities. These included deadhead mileage cost and facility labor costs. The cost of the revenue service (driver, fuel, parts, insurance, etc.) would not be expected to vary with changes in the facilities scheme being utilized. Therefore, direct cost of revenue service was not included in this comparative analysis.

Labor Costs. The labor costs required for facility operation will vary directly with the size and function of a garage facility.

Staffing guidelines were formulated for the purpose of determining the relationships between facility size, function and labor costs. The guidelines were based on generally accepted industry standards and a review of staffing levels at the existing suburban bus carriers in the RTA region.

Deadhead Costs. The efficiencies of large centralized bus facilities must be balanced against the cost of operating the buses between the garage and the location of the revenue service. This movement from garage to revenue service is called "deadhead". While the cost of each deadhead mile varies from carrier to carrier, a single unit cost factor was used by this study. The single factor minimized the impact of transitory labor rates, maintenance cost, and operating characteristics. The overall unit cost of deadhead mileage was calculated to $1.50 per mile.

Non-Monetary Factors

In addition to the above financial factors the following three additional evaluation areas were defined 1) Ease of Implementation, 2) Phasing Opportunities, and 3) System Compatibility.

Ease of Implementation. Such concerns as size of the site required, ability to locate near the service area centroid, and environmental concerns were evaluated.

Phasing Opportunities. The ability to stage the development of an individual project as well as the phasing of all the improvements throughout the region were considered.

System Compatibility. The final non-monetary factor of system compatibility had to do with the relationship of the project to the overall regional facilities plan. Factors such as ease of management and system control were evaluated.

Evaluation Results and Conclusions

Once the alternatives had been defined and the evaluation criteria identified, the evaluation methodology described above was applied to each alternative. The first step was an economic analysis of the alternatives. This analysis is summarizes in Table 10.

As this table reveals, there are clear differences among the alternatives. As expected; Alternatives 1 and 2, which have large centralized facilities, have high deadhead mileage costs. However, they also have low administrative and maintenance costs. The more decentralized concepts, such as Alternatives 5 and 6, have much lower deadhead costs but higher costs for administration and maintenance.

When deadhead cost is combined with the cost of administration and maintenance, the resulting total annual operating costs show little variation among the alternatives. In fact, there is only a 3.2 percent variation from the most expensive to least expensive alternative.

TABLE 10

ECONOMIC EVALUATION

Alternative	Annual[1] Deadhead Cost ('000)	Annual Administrative & Maintenance Cost ('000)	Total Annual[2] Operating Cost ('000)	Total Capital Cost ('000)	Annualized[3] Capital Cost ('000)	Total Annualized Cost ('000)
1	$10,220	$12,280	$22,500	$55,155	$5,765	$28,265
2	8,645	13,730	22,375	57,820	5,980	28,355
3	7,455	14,345	21,800	60,100	6,215	28,015
4	7,365	14,715	22,080	59,710	6,175	28,255
5	6,900	15,035	21,935	63,595	6,325	28,260
6	6,815	15,115	21,930	60,695	6,285	28,215

1 Includes cost for movement of buses between divison and inspection facilities.

2 Does not include cost of revenue service which would remain constant across all alternatives.

3 10 percent interest rate; 40 year life for buildings; and 20 year life for equipment.

While the evaluation was initially conducted on a regional basis, it was found that subregional comparisons yielded a much better understanding of the differences among the alternatives. The following discussions consider the North, West, South and Fox Valley subregions separately.

The series of financial evaluation tables in this section are based on uniform labor rates throughout the suburban area. The impact of the continuation of the existing differential labor rates was analyzed and will be discussed wherever pertinent.

North Area. Table 11 presents the results of the economic evaluation of the North area alternatives. The lowest deadhead cost estimates were found in Alternatives 4 and 6. Not surprisingly, these were the alternatives with the most facilities.

The single division concept tested in Alternatives 5 and 6 was found to be economically desirable. A comparison of Alternative 3 with Alternative 5 illustrates this difference. The service areas were the same in the two alternatives except that in Alternative 3 a two division concept was tested and in Alternative 5 a one division concept was tested. The result was an estimated $145,000 annual operating cost savings with a single division.

The continued use of the Highland Park facility was tested in Alternatives 2 and 3. In Alternative 2, the Highland Park/Deerfield area was served from a single North Shore facility. Alternative 3 served that area from a separate inspection facility. As Table 11 illustrates, a $215,000 annual deadhead savings is realized from the use of the separate facility. However, $165,000 of added administrative and maintenance cost are projected. This combination yields an annual cost savings of some $50,000 with a single facility. (If the differential labor rate at Highland Park were to be continued, the savings would be substantially increased).

The continued use of the Wilmette facility was tested in Alternatives 5 and 6. Alternative 6, which includes the Wilmette facility, resulted in slightly lower deadhead costs and higher administrative and maintenance costs. Overall, the continued use of the Wilmette facility is estimated to cost approximately $175,000 per year more than a combined North Shore facility. However, the above

TABLE 11

NORTH AREA ECONOMIC EVALUATION

Alternative	Annual Deadhead Cost ('000)	Annual Administrative & Maintenance Cost ('000)	Total Annual Operating Cost ('000)	Total Capital Cost ('000)	Annualized Capital Cost ('000)	Total Annualized Cost ('000)
1[1]	$3,575	$3,655	$7,230	$15,450	$1,670	$8,900
2	2,230	4,740	6,970	18,140	1,875	8,845
3	2,015	4,905	6,920	18,285	1,890	8,810
4	1,935	5,150	7,085	18,165	1,875	8,960
5	2,015	4,660	6,675	17,615	1,830	8,505
6	1,935	4,905	6,840	17,495	1,815	8,655

(1) Cost adjusted to reflect same service area as other alternatives.

conclusions were based on uniform labor rates. If the existing lower Wilbus labor rates continue, the use of the Wilmette facility was projected to save $135,000 each year.

Alternative 6 is the prefered development concept in the North area. This alternative should be easy to implement, can be phased and is compatible with RTA's management abilities and the desires of the communities and other public bodies involved. However, the North Shore facility should be engineered and constructed to allow for the potential addition of the Wilmette service should the existing operating cost advantages be lost.

South Area. Table 12 summarizes the economic evaluation of the South Area alternatives. Again, deadhead cost varied directly with the number of facilities. The deadhead cost for Alternative 1, with two facilities, was projected to be $750,000 higher than Alternatives 5 and 6, which have four facilities. However, the overall operating cost of Alternative 1 was only $75,000 more than Alternatives 5 and 6. This was due to the higher administrative and maintenance costs of the four facility alternatives.

TABLE 12

SOUTH AREA ECONOMIC EVALUATION

Alternative	Annual Deadhead Cost ('000)	Annual Administrative & Maintenance Cost ('000)	Total Annual Operating Cost ('000)	Total Capital Cost ('000)	Annualized Capital Cost ('000)	Total Annualized Cost ('000)
1	$2,425	$3,315	$5,775	$13,405	$1,380	$7,155
2	2,030	3,715	5,745	13,480	1,390	7,135
3	2,030	3,910	5,940	13,685	1,410	7,350
4	2,030	3,715	5,745	13,480	1,390	7,135
5	1,680	4,020	5,700	14,730	1,520	7,220
6	1,680	4,020	5,700	14,730	1,520	7,220

With the exception of Alternative 3, which tested a free standing division garage in Joliet, the differences in the total annualized cost estimates were only about 1 percent.

Alternative 3 evaluated the impact of a separate Joliet Division. The resulting annual operating cost was projected to be nearly $200,000 greater than with Joliet as an inspection facility in a South area division.

Alternative 2 is was prefered concept in the South Area. The four facility division analyzed in Alternative 5 and the three facility division of Alternative 2 presented a very similar overall financial picture. Also, no significant differences were noted in ease of implementation or phasing opportunities. Therefore, there seemed to be no advantage to the addition of the extra facility with its added management responsibilities.

West Area. The economic evaluation summary for the West Area is presented in Table 13. Again, deadhead costs were reduced as the number of facilities increased. The impact of going from a single facility (Alternatives 1 and 2) to two facilities (Alternatives 3 and 4) was a savings of nearly $1 million in deadhead. The addition of a third facility (Alternatives 5 and 6) saved an additional $270,000.

TABLE 13

WEST AREA ECONOMIC EVALUATION

Alternative	Annual Deadhead Cost ('000)	Annual Administrative & Maintenance Cost ('000)	Total Annual Operating Cost ('000)	Total Capital Cost ('000)	Annualized Capital Cost ('000)	Total Annualized Cost ('000)
1[1]	$3,605	$3,625	$7,230	$19,850	$2,050	$9,280
2	3,605	3,625	7,230	19,850	2,050	9,280
3	2,685	4,000	6,685	22,015	2,280	8,970
4	2,685	4,310	6,995	22,025	2,280	9,275
5	2,415	4,475	6,890	22,140	2,295	9,185
6	2,415	4,725	7,140	22,430	2,320	9,460

(1) Adjusted to reflect same service area as other alternatives.

The idea of a separate DuPage division was tested in Alternatives 4 and 6. It was estimated that $250,000 to $300,000 additional annual operating cost would result from two divisions in the west area over a single division.

The three facility division of Alternative 5 would result in an estimated annual operating cost of $200,000 more than the two facility division of Alternative 3. However, a site of 14 acres would be required for the West Cook facility in Alternative 3. The smaller West Cook facility in Alternative 5 would reduce the site requirement to 9 acres. This consideration may be a deciding factor in the RTA's ability to implement the plan.

Alternative 3 was the prefered development concept in the West Area. This alternative appeared to offer a clear economic advantage over the other schemes evaluated. However, as the above discussion pointed out, the West Cook County facility would require a large site. If the site selection process does not reveal such a site, then Alternative 5 would be an acceptable compromise development plan.

Fox Valley. During the evaluation of the North and West Areas, it was found that the large centralized facilities tested in Alternative 1 (North Area) and Alternatives 1 and 2 (West Area) did not appear to be desirable. Therefore, the evaluation in the Fox Valley area

concentrated on the two basic concepts define by Alternatives 3 and 4.

Table 14 summarizes the economic evaluation of these two alternatives. The total annualized costs projected for these two alternatives differ by only $40,000. The two division concept tested by Alternative 3 was projected to be less expensive to operate. This conclusion runs counter to the conclusions reached in the North, West and South areas.

Upon further examination, it was found that this difference was caused by the application of the staffing standards developed in earlier phases. The size of the single division facility in Elgin in Alternative 4 was just above a threshold for staffing that caused the addition of a few specialized staff, such as accountants, that had not been included with the smaller facilities in Alternative 3. Therefore, it appears reasonable to assume that the economics of these alternatives would be about equal.

Alternative 4 was the prefered concept in the Fox Valley Area. While the economic analysis did not point to any clear advantage of either of the alternatives, the single divison presented in Alternative 4 should be somewhat easier for the RTA to manage than the two divison concept tested in Alternative 3. Also, the centralization of maintenance functions at the single division facility should improve the quality of the maintenance program.

TABLE 14

FOX VALLEY AREA ECONOMIC EVALUATION

Alternative	Annual Deadhead Cost ('000)	Annual Administrative & Maintenance Cost ('000)	Total Annual Operating Cost ('000)	Total Capital Cost ('000)	Annualized Capital Cost ('000)	Total Annualized Cost ('000)
3	$ 705	$2,025	$2,730	$8,705	$ 820	$3,550
4	705	2,075	2,780	8,610	810	3,590

Paratransit Requirements

The Regional Transportation Authority now operates twenty three paratransit projects. These services are operated using a fleet of forty-eight Superior Transliner vehicles. These vehicles are gasoline powered and are twenty-one feet long.

It is projected that the fleet of paratransit vehicles will grow to 375 by 1990 and will stabilize at that level. The distribution of the fleet is expected to be 135 vehicles in the North Area, 115 vehicles in the West Area, 65 vehicles in the South Area, and 60 vehicles in the Fox Valley Area. Figure 12 illustrates the projected distribution of the paratransit fleet.

The estimate of the size and distribution of the paratransit vehicle fleet was based on an analysis of future population density and concentrations of elderly and/or handicapped individuals. The use of paratransit vehicles for general purpose public transportation in areas of lower population density (generally in areas of less than 3000 people per square mile) and for special purpose transportation in areas of higher density with high elderly and handicapped populations is anticipated.

At the present time, the paratransit services are administered through contracts between the RTA and the sponsoring agency. Vehicle storage and maintenance is the responsibility of the sponsor. It is anticipated that this arrangement will remain the same throughout the foreseeable future.

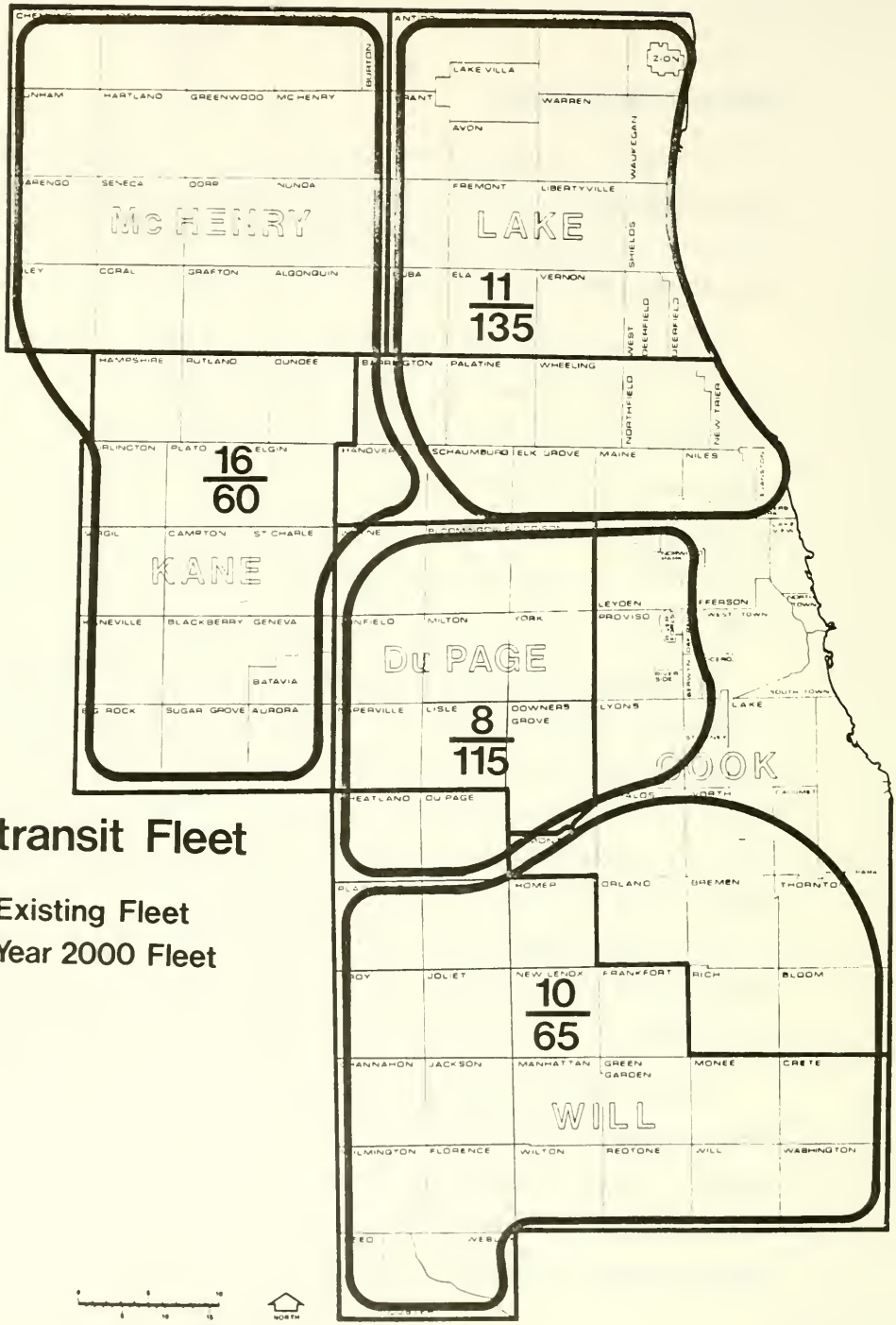

Figure 12

Paratransit Fleet

00 Existing Fleet
00 Year 2000 Fleet

However, major vehicle maintenance has proven to be a troublesome area for the project sponsors. Therefore, major maintenance for the paratransit vehicles sould be provided at each division facility. This would be the same relationship that would exist between the inspection garages and the division garages.

Table 15 summarizes that capital improvements that would be required at each division garage to accommodate major maintenance for the paratransit fleet operated within the operating division. As indicated in this table, estimated capital improvements costing $625,000 will be required to accommodate the paratransit fleet's major maintenance at the division garages.

TABLE 15

PARATRANSIT FLEET FACILITY REQUIREMENTS

Facility	Paratransit Fleet Size	Required Capital Facilities	Estimated Cost
North Division	135	∘ 4 Maintenance Bays ∘ 360 sq. ft.-work area ∘ 1350 sq. ft.-parts storage	$200,000
West Division	115	∘ 3 Maintenance Bays ∘ 360 sq. ft.-work area ∘ 1150 sq. ft.- parts storage	$175,000
South Division	65	∘ 2 Maintenance Bays ∘ 240 sq. ft.-work area ∘ 650 sq. ft.-parts storage	$125,000
Fox Valley Division	60	∘ 2 Maintenance Bays ∘ 240 sq. ft.-work area ∘ 600 sq. ft.-parts storage	$125,000
TOTAL	375		$625,000

CHAPTER 6

RECOMMENDED PLAN

The need for improvement to the RTA bus storage and maintenance system was evaluated in this study. Based on the analysis of existing conditions and projections of future increases to the bus fleet, a plan for capital investment in garage facilities was developed.

The recommended plan is presented in Figure 13. Five operating divisions: North, West, South, Fox Valley, and Chicago are recommended. Each of the suburban operating divisions include one division level garage and one or more inspection garages. The inspection garages would be responsible for daily operations, servicing and running repairs. The division garage would have the same responsibilities as the inspections garages for the vehicles operated out of that facility. In addition, it would be responsible for major administrative and maintenance functions for all of the facilities in the division. Major maintenance activities for the Paratransit fleet will also be conducted at the division garages. The Chicago division is summarized in the CTA Facilities Plan. It will include ten operating garages and a central main shop facility.

The recommended plan calls for the development of eight new facilities and improvements to the remaining six facilities. Table 16 presents an economic summary of the recommended suburban plan. A total of $60 million worth of capital improvements are recommended. Of this total, $35 million should take place during the next five years. The initial program of improvements is summarized in Figure 14.

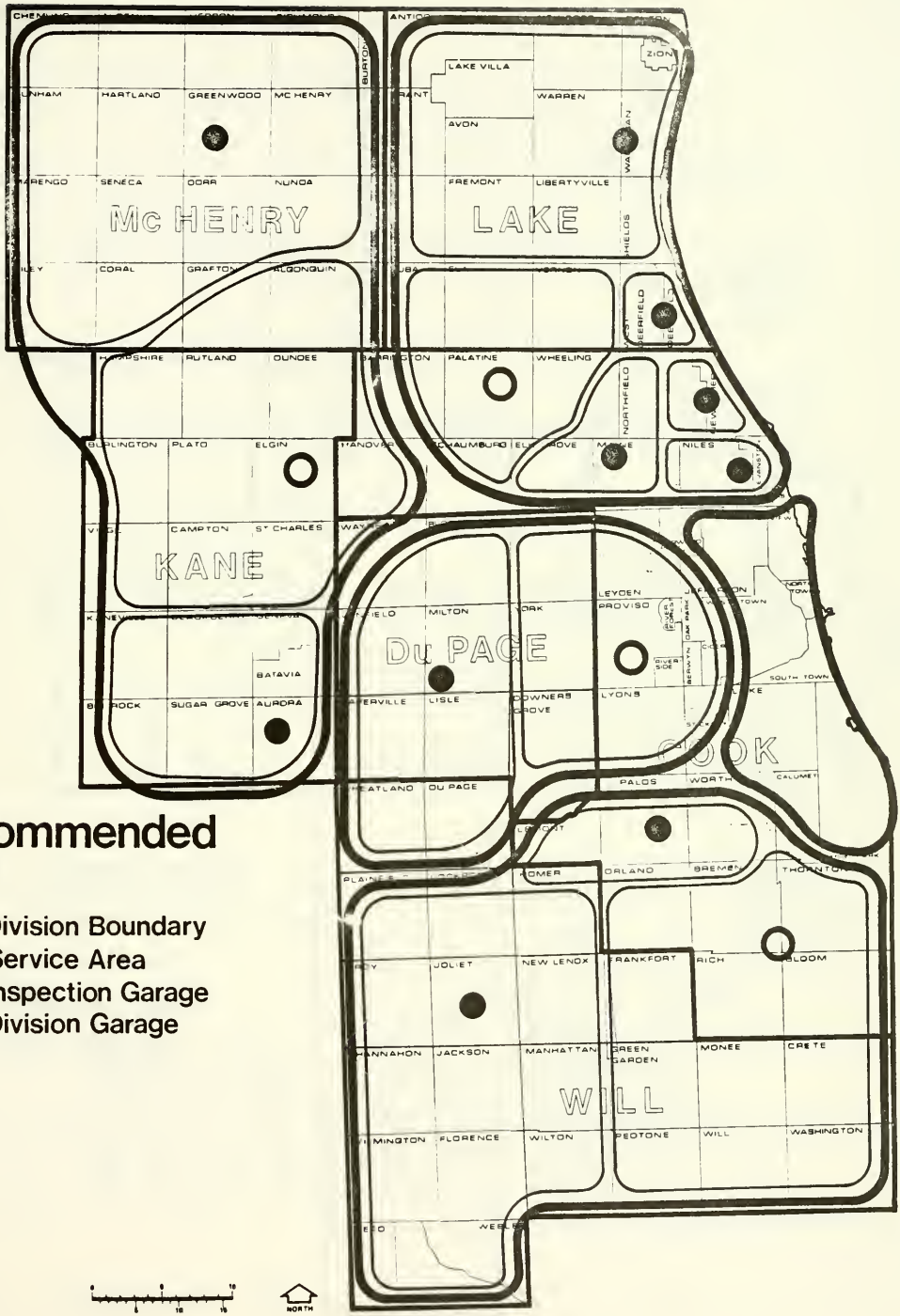

Figure 13

Recommended Plan

- Division Boundary
- Service Area
- Inspection Garage
- Division Garage

TABLE 16

RECOMMENDED PLAN -- ECONOMIC SUMMARY

FACILITY	YEAR 2000 FLEET Transit Vehicles	YEAR 2000 FLEET Paratransit Vehicles ('000)	Total Capital Requirement ('000)	Initial Phase Capital ('000)	Annual[1] Operations Cost ('000)
NORTH DIVISION	360	135	$17,695	$ 6,250	$ 6,840
Division Garage	95	---[2]	6,870	-0-	
Division Garage	---	135[2]	200	-0-	
North Shore Inspection	80	---	4,555	4,555	
Wilmette Inspection	25	---	1,215	355	
NORTRAN Inspection	80	---	1,360	1,360	
Waukegan Inspection	65	---	2,700	-0-	
Highland Park Inspection	15	---	795	-0-	
SOUTH DIVISION	320	65	$13,730	$11,625	$ 5,745
Division Garage	175	---[2]	8,850	7,650	
Division Garage	---	65[2]	125	125	
Suburban Inspection	80	---	2,330	-0-	
Joliet Inspection	65	---	1,300	1,330	
South Holland Inspection[3]	---	---	---	2,550	
WEST DIVISION	350	115	$19,620	$13,175	$ 6,130
Division Garage	230	---[2]	13,000	13,000	
Division Garage	---	115[2]	175	175	
DuPage Inspection	120	---	6,445	-0-	
FOX VALLEY DIVISION	125	60	8,735	4,565	2,780
Division Garage	65	---[2]	4,440	4,440	
Division Garage	---	60[2]	125	125	
Aurora Inspection	40	---	2,570	-0-	
McHenry Inspection	20	---	1,600	-0-	
TOTAL	1,155	375	$59,775	$35,615	

(1) Includes deadhead maintenance and administration costs. Does not include revenue service.

(2) Major maintenance activities only.

(3) South Holland Inspection Garage used in initial phase as interim facility.

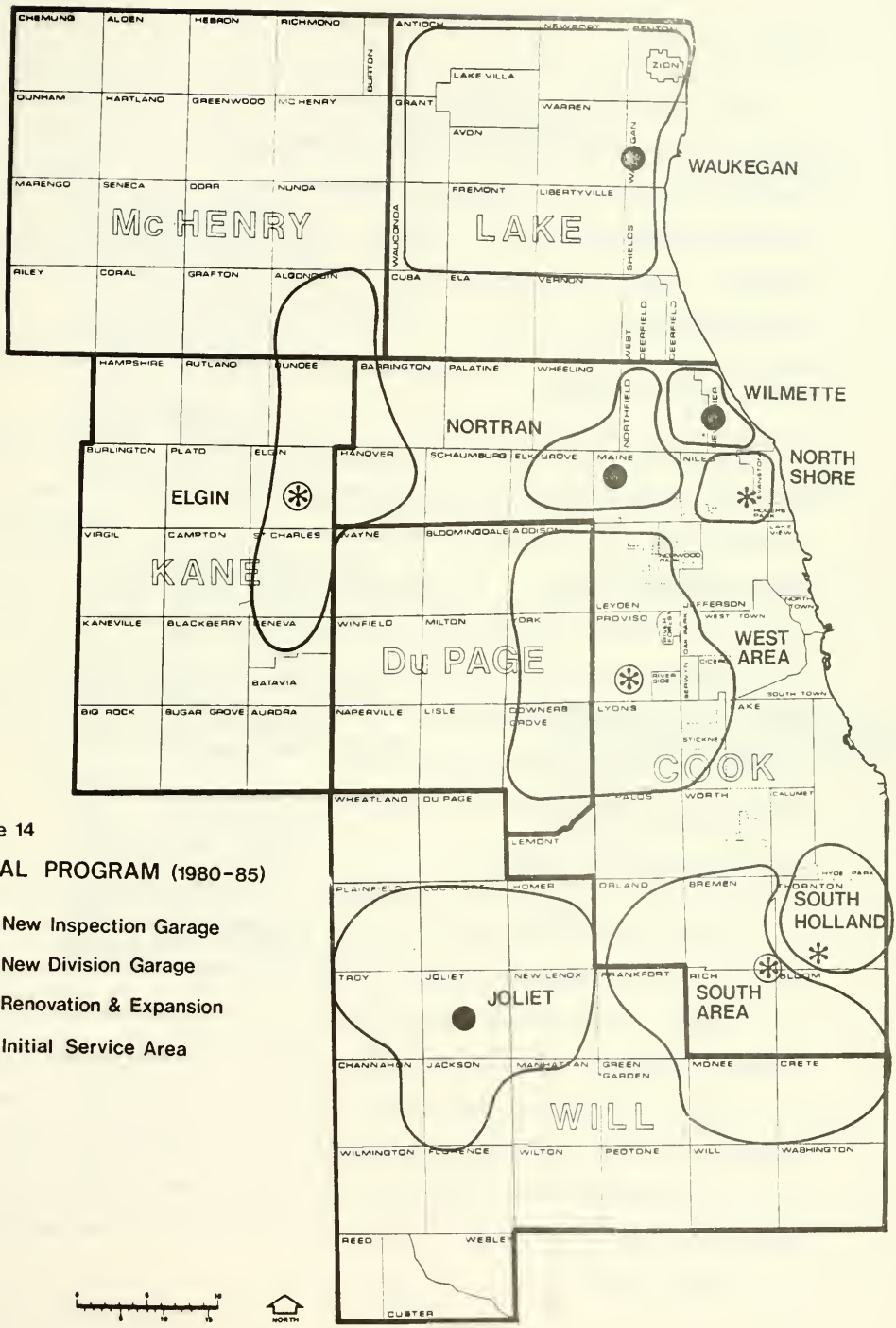

Figure 14

INITIAL PROGRAM (1980-85)

- ✻ New Inspection Garage
- ⊛ New Division Garage
- ● Renovation & Expansion
- — Initial Service Area

NORTH DIVISION

The recommended plan for the North Division includes six garage facilities. The division garage should be located in Palatine Township. Inspection garages should be located in Waukegan, Highland Park, Wilmette, Niles Township and at NORTRAN. Table 17 presents a summary of North Division recommendations.

North Division Garage

The division facility should be located in Palatine Township. This new facility would be responsible for the daily operation of 95 vehicles serving Northwest Cook County and Southwest Lake County. In addition, it would provide centralized administration and major maintenance activities for the 360 transit buses and 135 Paratransit vehicles in the division. This new division facility has an estimated cost of $7,070,000 and will require a seven acre site. This facility is recommended as a second phase improvement.

NORTRAN Inspection Garage

The existing NORTRAN facility is recommended for reuse as an 80 vehicle inspection garage. It would serve North Central Cook County. Recommended improvements include the addition of a second level to the office area, enclosed storage space for an added 15 vehicles, and improvements to the drivers and mechanics locker and restroom facilities. These improvements have an estimated cost of $1,360,000 and will not require any additional land acquisition. These improvements are recommended in the initial phase.

TABLE 17

NORTH AREA RECOMMENDATIONS

Facility	Type of Improvement
Phase I	
o New North Shore Garage Size: 80 Vehicles Location: South East Skokie Function: Inspection Garage Land Area Required: 4 1/2 acres Estimated Cost: $4,555,000	o New inspection facility.
o Renovate and Expand Wilmette (Phase I) Size: 25 Vehicles Location: West Wilmette Function: Inspection Garage Land Area Required: None (Village Property) Estimated Cost: $335,000	o Additional vehicle storage space. o Additional vehicle maintenance space.
o Renovate NORTRAN Garage Size: 80 Vehicles Location: Western Des Plaines Function: Inspection Garage Land Area Required: None (existing site) Estimated Cost: $1,360,000	o Add second level to office area. o Add storage space for 15 vehicles. o Add driver and mechanic locker/rest room facilities.
Phase II	
o New North Division Garage Size: 95 Vehicles (daily operation) 360 Vehicles (division maintenance) 135 Vehicles (paratransit maintenance) Location: Eastern Palatine Function: Division Garage Land Area Required: 7 acres Estimated Cost: $6,870,000	o New Facility that would function as the Division Garage for the entire north area.
o Renovate and Expand Waukegan Garage Size: 65 Vehicles Location: Western Waukegan Function: Inspection Garage Land Area Required: None (existing site) Estimated Cost: $2,700,000	o Improvements are required to vehicle storage, maintenance areas, transportation areas (especially driver waiting/locker areas); and vehicle servicing (bus washer, vaulting and fueling island, cyclone cleaner).
o Renovate and Expand Highland Park Garage Size: 15 Vehicles Location: West Highland Park Function: Inspection Garage Land Area Required: None (existing site) Estimated Cost: $795,000	o Improvements to vehicle storage, maintenance and servicing space.
o Renovate and Expand Wilmette (Phase II) Size: 25 Vehicles Location: West Wilmette Function: Inspection Garage Land Area Required: None (existing site) Estimated Cost: $860,000	o Improve vehicle servicing and maintenance areas.

North Shore Inspection Garage

A new North Shore inspection facility is recommended for East Niles Township. This new facility would be responsible for the daily operation and storage of 80 vehicles serving the Niles and Evanston Township areas. The estimated cost for this new inspection facility is $4,500,000. A site of four and one-half acres is required. This facility is recommended for initial phase implementation.

Wilmette Inspection Garage

The existing facility in Wilmette should be expanded and renovated to provide an inspection facility for 25 vehicles serving New Trier and Northfield Townships. Improvements to vehicle storage, servicing, and maintenance areas will be required. The estimated cost of these improvements is $1,215,000. No additional land acquisition will be required. It is recommended that only vehicle storage and minor maintenance area improvements be implemented during the initial phase. The cost of the initial improvements is estimated to be $335,000.

Highland Park Inspection Garage

The existing facility in Highland Park should be expanded and renovated to provide an inspection garage for 15 vehicles serving the Highland Park-Deerfield area. Improvements to vehicle storage, maintenance, and servicing areas are recommended. These improvements are estimated to cost $795,000.

Waukegan Inspection Garage

The existing Waukegan-North Chicago Transit facility should be expanded and renovated to provide an inspection garage for 65 vehicles serving Lake County. These improvements include vehicle storage, maintenance, service areas, driver waiting and locker rooms. The estimated cost of these improvements is $2,700,000. These improvements are recommended for the second phase of the program.

SOUTH DIVISION

The recommended plan proposes a South Division which is composed of a division garage in South Cook County and inspection garages in Southwest Cook County and Joliet. On an interim basis, an inspection facility in South Holland is recommended. Table 18 summarizes the facility improvements in the South Division.

South Division Garage

A new South Division garage is recommended for the Harvey/Hazel Crest area. This facility would be responsible for the daily operation of 175 vehicles serving South Cook and East Will Counties. In addition, centralized administration and major maintenance for the division's entire fleet of 360 transit buses and 65 paratransit vehicles would occur at this facility. The capital cost of this facility is projected to be $8,975,000. A site of ten and one-half acres will be required. It is recommended that this facility be constructed in two

SOUTH AREA RECOMMENDATIONS

Facility	Type of Improvement
Phase I	
o Purchase and Renovate South Holland Building Size: 40 Vehicles Location: Western South Holland Function: Inspection Garage Land Area Required: 2.2 acres Estimated Cost: $2,550,000	o Inspection garage to relieve overcrowding present South Suburban Safeway facility. o Facility will be phased out as South Division facility becomes operations.
o Construct a South Area Garage Size: 135 Vehicles (daily operation) 320 Vehicles (division maintenance) 65 Vehicles (paratransit maintenance) Location: Northeastern Hazel Crest/Southwest Markham Function: Division Garage Land Area Required: 10 1/2 acres Estimated Cost: $7,650,000	o New Division level garage for the south area.
o Renovate and Expand Joliet Size: 65 Vehicles Location: South-Central Joliet Function: Inspection Garage Land Area Required: 1 1/2 - 2 acres Estimated Cost: $1,300,000	o Expansion of vehicle storage and Maintenance area. o Expansion of Transportation and Servicing space. o Note: On site parking for all employees add 1 1/2 acres to site requirement.
Phase II	
o Renovate and Expand Suburban Transit Garage Size: 80 Vehicles Location: West-Central Oak Lawn Function: Inspection Garage Land Area Required: None (existing site plus carwash location) Estimated Cost: $2,330,000	o Expansion of Vehicle Storage and Maintenance Areas to present car wash location. o Expansion of Transportation space especially driver waiting/lunch/locker room. o Improve vehicle servicing area. o Note: On site parking not now available for drivers. Provision of on site space would require 1-2 additional acres of land or reduction of fleet size by 30 vehicles.
o Expand South Area Garage Size: 40 additional Vehicles Location: Hazel Crest/Markham Function: Division Land Area Required: None Estimated Cost: $1,200,000 less sale of South Holland	o Expansion of South Area Garage to include services initially operated at South Holland.

phases. The first phase would provide capacity for 135 vehicles and cost $7,775,000. The second would add storage space for an additional 40 vehicles and cost $1,200,000. The second phase development would include the shifting of the South Holland service into the South Division facility.

Suburban Transit Inspection Garage

The present Suburban Transit facility in West-Central Oak Lawn should be expanded and renovated. The facility would serve as an inspection garage for 80 vehicles in Southwest Cook County. Recommended improvements include the expansion of vehicle storage and maintenance areas and improvements to the driver and mechanic locker and lunch rooms. The improvements have an estimated cost of $2,330,000. No additional land will be required. However, the portion of the site now used by the car wash will have to be converted to transit facility uses. Also, on-site parking for all drivers is not now available. If driver parking is provided on-site, the facility would have to be reduced to a 50 bus garage with 30 buses reassigned to the South Division facility. As an alternative, adjacent land could be acquired for driver parking. The improvements are recommended for second phase implementation.

Joliet Inspection Garage

The existing Joliet facility is recommended for reuse as a 65 vehicle inspection garage serving Joliet and adjoining Will County. Recommended improvements include expansion of vehicle storage, maintenance and servicing areas and improvement to the

transportation area. These improvements have an estimated cost of $1,300,000 and would require one to two acres of additional land. The land requirement is dependent upon the amount of driver parking provided on site. These improvements are recommended for the initial phase.

South Holland Inspection Garage

To relieve the severe overcrowding at the present South Suburban Safeway facility in Harvey, the acquisition of a warehouse building property in South Holland is recommended. This existing facility, at 405-409 West Taft Drive, can be quickly converted into an inspection garage for 40 vehicles. The use of this facility should continue for the next several years. Once the second phase expansion of the South Division garage is completed, the services operated from the South Holland facility should be transfered to it and the South Holland garage sold. The cost of acquisition and rennovation is estimated to be $2,550,000, much of which will be recovered at the time of sale.

WEST DIVISION

The recommended plan for the West Division includes two facilities. The division garage should be located in Proviso Township and the inspection garage in Milton Township. While the two facility division is recommended, a three facility plan is offered as an alternative should a site for the West Division garage prove too difficult to locate. Table 19 presents the West Area recommendations and the alternative plan.

TABLE 19

WEST AREA RECOMMENDATIONS

Facility	Type of Improvement
Phase I	
o West Area Division Garage Size: 230 Vehicles (daily operation) 350 Vehicles (division maintenance) 115 Vehicles (paratransit maintenance) Location: Proviso Township Function: Division Garage Land Area Required: 14 1/2 acres Estimated Cost: $13,000,000	o New division level facility for the west service area.
Phase II	
o DuPage Inspection Garage Size: 120 Vehicles Location: Milton Township Function: Inspection Garage Land Area Required: 7 acres Estimated Cost: $6,445,000	o New inspection facility to serve western two-thirds of DuPage County and Bolingbrook.
Optional Recommendation:	
Phase I	
o West Area Division Garage Size: 165 Vehicles Location: Proviso Township Function: Inspection Garage Land Area Required: 10 acres Estimated Cost: $9,795,000	o Would serve same function as preferred West Area Garage but would have smaller land area requirement.
Phase II	
o Dupage Inspection Garage Size: 125 Vehicles Location: Milton Township Function: Inspection Garage Land Area Required: 7 acres Estimated Cost: $6,910,000	o New inspection garage serving central DuPage County.
o Naperville Inspection Garage Size: 65 Vehicles Location: Naperville Township Function: Inspection Garage Land Area Required: 4 Acres Estimated Cost: $3,430,000	o New inpsection garage serving Naperville and Lisle Townships in DuPage County and DuPage Township in Will County.

West Division Garage

A new West Division garage is recommended for the Proviso Township area. The facility would be responsible for the daily operation of 230 vehicles in West Cook and East DuPage Counties. The facility would also provide centralized administration and major maintenance for the 350 transit buses and 115 paratransit vehicles in the division. The cost of the new facility is estimated to be $13,175,000. A site of fourteen and one-half acres will be required. This facility is recommended for implementation during the initial phase of the program.

DuPage Inspection Garage

A new DuPage Inspection garage for 120 vehicles is recommended. The facility should be located in Southwest Milton Township and should serve the western two-thirds of DuPage County and the Bolingbrook area of Will County. The cost of the new facility is estimated to be $6,445,000 and require a 7 acre site.

FOX VALLEY DIVISION

The recommended plan for the Fox Valley Division includes a division garage in Elgin and inspection garages in Aurora and McHenry County. Table 20 presents a summary of the Fox Valley recommendations.

TABLE 20

FOX VALLEY RECOMMENDATIONS

Facility	Type of Improvement
Phase I	
o Fox Valley Division Garage Size: 65 Vehicles (daily operation) 125 Vehicles (division maintenance) Location: Central Elgin Function: Division Garage Land Area Required: 5 acres Estimated Cost: $4,440,000	o New division garage serving the central Fox Valley area.
Phase II	
o Aurora Inspection Garage Size: 40 Vehicles Location: Northeast Aurora Function: Inspection Garage Land Area Required: 3 acres Estimated Cost: $2,570,000	o Reflects a new inspection garage. It may be possible to renovate and expand existing Aurora garage at lower cost.
o McHenry Inspection Garage Size: 20 Vehicles Location: Northeast Woodstock Function: Inspection Garage Land Area Required: 2 acres Estimated Cost: $1,600,000	o New inspection garage serving all of McHenry County except the southeast corner.

Fox Valley Division Garage

A new division garage is recommended for Elgin. The facility would be responsible for the daily operation of 65 vehicles in the Central Fox Valley area. In addition, it will have administrative and major maintenance responsibilities for the division's total fleet of 125 transit buses and 60 paratransit vehicles. The cost of the new facility is estimated to be $4,565,000 and it will require 5 acres of land. The Fox Valley division garage in Elgin should be built during the first phase of development.

Aurora Inspection Garage

An inspection garage for 40 vehicles is recommended for the Aurora area. While the recommendation in Table 20 is for a new facility, it may be possible to renovate and expand the existing garage. The expansion would require the relocation of some Aurora Public Works activities. If these activities can be relocated, the existing site can be used. If they cannot be relocated, a new facility will be required. The estimated cost of a new inspection facility is $2,570,000 and will require 3 acres of land. The Aurora inspection facility should be built in a second phase development.

McHenry County Inspection Garage

A small inspection garage of 20 vehicles is recommended for McHenry County. This facility would serve all of McHenry County except for the southeastern corner. This facility is

6) Land Acquisition and Engineering. Once funding has been approved, the site must be acquired and the project engineering completed.

7) Construction. The final step is the actual construction of the facility.